Scientific Technologies Corporation

ALASKA

Immunization Registry

Needs Assessment and Feasibility Study

Sections 1 - 7

Final

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1.0 Executive Summary

Included in the Executive Summary are the following topics:

- Purpose of the Feasibility Study
- Scientific Technologies Corporation (STC) Recommendations
- Cost and Timelines
- Registry Implementation Concerns
- The Immunization Environment in Alaska – Summary of the Feasibility Plan Discovery Process and Registry Implementation Requirements

1.1 Purpose of the Feasibility Study

Much effort, in both the public and private sector, is put forth across the state of Alaska to ensure vaccine is delivered to all residents. The data collected and shared by these efforts is recorded and located in multiple systems that are both electronic and paper based. Alaska lacks a centralized patient immunization record that is accessible by all health care providers and schools across the public and private sectors. Currently, no system exists that consolidates the fragmented immunization record into a single "gold standard."

In 1992, the Centers for Disease Control and Prevention (CDC), National Immunization Program, initiated a challenge to increase immunization coverage rates to 90% for all children by the age of 24 months. In support of this challenge, the CDC established the vision for the use of information technology to help obtain this goal. The concept of statewide immunization registries to track children was created. Through CDC leadership this vision is being achieved through best practices established by immunization programs throughout the country. The CDC and the immunization community have worked to develop programs, policies and processes to facilitate the successful implementation of statewide registries.

While many states have moved ahead with the implementation of immunization registries, Alaska has not done so for a number of reasons. Prior to this study, there has been no convincing evidence that the benefits of a statewide immunization registry system would outweigh the costs of registry implementation and operation. Furthermore, it has not been clear that a statewide immunization registry was feasible given the challenges of the Alaska environment.

The purpose of this study is to examine the challenges Alaska faces in light of the benefits to be gained by committing resources and funding for a statewide immunization information system.

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As a consulting firm experienced in the development and deployment of statewide immunization registries, Scientific Technologies Corporation (STC) was contracted to evaluate the feasibility of establishing a statewide electronic immunization registry of children's immunizations in Alaska. This report documents the results of the needs assessment and provides recommendations in regard to the establishment of an immunization registry. It also provides a basic plan of the items to be considered for this initiative, including project timelines and expected costs. STC is pleased to present these findings and recommendations to the Alaska Department of Health and Social Services, Division of Public Health, Section of Epidemiology.

1.2 STC Recommendations

Based on information gathered through stakeholder interviews, provider surveys and STC's experience, STC has determined that the State of Alaska Department of Health and Social Services, the Alaska Native health corporations, the private provider community, as well as Alaska citizens would benefit greatly from implementation of a statewide immunization registry.

In addition to improving immunization programmatic operations, vaccine coverage and record tracking, implementation of a statewide immunization registry would put Alaska in line with national goals for registry participation, VFC enhancement efforts and system integration efforts with other public health program information systems. The immunization registry will serve to centralize and consolidate the immunization records of children throughout the state and provide the essential immunization information needed by all authorized providers of immunization services.

With the centralization and consolidation of immunization records, providers will benefit from: reduced labor in tracking down vaccination histories for their patients, the use of registry tools for automated vaccination forecasting and patient reminder processes, and the registry reporting capabilities.

The Alaska Department of Health and Social Services will benefit as well. With the majority of the Alaska children represented in the Alaska State Immunization Registry (ASIR) database and accessible by the majority of the providers, the ASIR toolset will provide opportunities to better manage vaccine inventories, reduce the risks of over-vaccination, monitor statewide immunization coverage by geographic areas and provide the tools to potentially improve immunization rates. Immunization registries do not by themselves raise immunization rates but they can provide an effective means for the immunization program to enhance and automate many processes in carrying out their mission.

A population based immunization registry that conforms to national standards such as those established by the Centers for Disease Control and prevention (CDC) Public Health Information Network (PHIN) will allow Alaska to benefit in ways that go beyond childhood immunization tracking. Given the current technologies that allow disparate electronic systems to share information and the processing of the information, also referred to as "interoperability" of

systems, Alaska will have opportunities to leverage the registry technology for other initiatives. Expansion of the registry to include adult populations opens the door for linkages to disease surveillance systems – useful in determining the vaccination histories in reported cases of vaccine preventable diseases. A number of states have enhanced their registries to encompass the tracking of "first responders" – personnel immunized and prepared to respond in the event of disease outbreaks such as smallpox, anthrax or bioterrorism incidents. Some states have modified the population based registries to provide the efficient recording of vaccinations administered or medications dispensed in mass vaccination scenarios. The value of mass vaccination registry features has been demonstrated through disease outbreak drills, as well as rapid data collection in flu clinics. STC recommends that Alaska consider these registry capabilities as a means to leverage the investment in the ASIR.

Other factors that can contribute to the feasibility of registry implementation in Alaska include the technology improvements and increased market competition in recent years, both leading to lower cost and the availability of robust, mature registry products. Reduced cost, coupled with lessons learned from other statewide registry deployments and Alaska's existing efforts and commitment to the immunization program, has created an environment conducive to the successful implementation of a statewide immunization registry.

Most importantly, the health of Alaska citizens can be maintained and improved through the effective electronic tracking of children's vaccination records resulting in timely reminders to parents, timely administration of vaccinations due, reduction of repeated vaccinations due to loss of records, and ultimately, reduction/elimination of disease outbreaks. The ASIR can also be effective in reducing the frustrations and time spent by parents or other responsible parties in obtaining vaccination records required by schools for immunization compliance. Maintenance of children's immunizations is foremost a responsibility of the parents or guardians, however a centralized, electronic tracking of the records can make up for poor record keeping.

These are some of the benefits of registry implementation that support the proposed recommendations. Additional benefits and the detail of these findings are documented throughout the body of this study.

1.3 Cost and Timelines

The costs, timelines and staffing requirements for implementation, maintenance and support of an immunization registry in Alaska are discussed in detail in this study. The following provides a brief summary:

- Projected costs for registry implementation are estimated at $629,250 - $1,850,050 for the first three years. Ongoing support beyond year three is estimated at $120 – 150 k/year for software maintenance, support and development.
- Registry implementation would be accomplished during the first three years.
- Year one would primarily include installation and public health deployment.

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- Years two and three would be focused on implementation in the private provider community and development of linkages required for automated data population of the registry with information from existing provider systems.
- A minimum of 2.25 to 3 full-time equivalent (FTE) positions will need to be dedicated to registry operations.

These costs/requirements are not unique to Alaska. Other states with populations similar in size to Alaska bear similar costs for their registries.

1.4 Registry Implementation Concerns

Significant concerns about the value of an immunization registry existed prior to the initiation of this assessment effort. All concerns were assessed during the discovery phase of the plan methodology. Existing issues/concerns include:

- A study conducted in 2000 provided evidence of a low rate of over-immunization. This study conducted by college interns in selected provider offices determined that the rate of over-immunization among a sample of 8,348 patients in the 0 to 35 month range was 0.8%. The result of the 2000 study does not support the notion that families are mobile and visit multiple providers resulting in “fragmentation” of children’s vaccination records.
- The lack of adequate Internet access infrastructure in Alaska would preclude many providers from using a Web-based immunization registry.
- The system in use by the Alaska Native health corporations, the public health centers and the Municipality of Anchorage (Resource and Patient Management System or RPMS) already functions as an immunization registry to some degree and captures a large portion immunization of immunization records for children aged 0-6 years (approximately 65%). RPMS users need to confine their data entry and reporting activities to RPMS only. Any requirement that they move between RPMS and a separate immunization registry application is not viable.
- Geographic and transportation barriers may make recruitment and training of providers a prohibitively costly endeavor.
- Providers may find the benefits of a registry don’t outweigh the additional labor that will be required of them.
- As independent organizations, the Alaska Native health corporations can choose not to share their patient records with other organizations.

These existing concerns, and the concerns discovered in the stakeholder interviews and surveys, are recognized and addressed in this document. The bottom line however, is that all of the issues can be overcome – similar issues have been encountered in other states, and registries have been successfully deployed in those states.

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1.5 The Immunization Environment in Alaska – Summary of the Feasibility Plan Discovery Process and Registry Implementation Requirements

Alaska is the largest state in terms of area but ranks 48th for total population at approximately 655,000 people. Alaska is a universal vaccine purchase state providing vaccine to all residents aged 0-18 years regardless of federal VFC eligibility status. In 2003, the state distributed over 400,000 doses to 236 vaccine providers throughout the state with an estimated value of over $6 million. Approximately 55% of total doses administered occur in the public sector, which includes the public health centers and Alaska Native health corporations, and the remaining 45% are administered in private physician offices. For CY 2003, the National Immunization Survey reported Alaska's immunization rate for the 4:3:1:3:3 series among 19-35 month olds to be 79.7%, which placed Alaska above the national average (79.4%) and ranked Alaska 27th among other states and the District of Colombia.

STC conducted 32 interviews with 42 primary stakeholders including public health staff and nurses, Alaska Native health corporations, private providers and schools and received 57 responses to a statewide survey of vaccine providers. This information gathering process with stakeholders was used to develop an understanding of the technical infrastructure, capabilities and attitudes of those associated with operating immunization programs and administering vaccinations in Alaska. All stakeholders presented unique needs, barriers, concerns and business processes.

The Interview participants provided extensive commentary on benefits and concerns along with additional suggestions and considerations of statewide registry implementation. A table summarizing these comments can be found in Appendix 7.4, Interview Comments. In general, those interviewed perceived the greatest benefits of a registry to be access to complete/accurate immunization information on all patients, reminder/recall capabilities and automatic production of immunization records. Participants were most concerned about cost, confidentiality and data sharing issues, staff resources for data entry, potential for integration with existing systems and what functionality a registry could offer them in their practice or immunization program.

Based on the interviews and survey responses, the most common findings/comments provided regarding the current system of operation were as follows (note: the following findings are based on stakeholder perceptions and subjective responses):

- Recording and reporting processes are often manual/paper based and very time consuming
- Families are very mobile and names change frequently
- RPMS does not always function as it should and data quality is reported (in some cases, not by all the respondents) to be poor or inconsistent
- RPMS data confidentiality issues and lack of access are a barrier for private providers, schools/child care providers and even some public health clinics

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- Vaccination records are often fragmented among multiple providers and consolidation/tracking efforts are very resource intensive for clinic staff and school personnel

Feedback from stakeholders implied that available PCs and internet access were adequate throughout the majority of the state. Some providers are currently conducting all reminder/recall efforts and incident response using a manual approach of pulling charts and reviewing historical records. These practices would benefit from an electronic application to assist with these tasks. Most providers reported that they would be willing to spend 1-5 hours/month on data entry and record maintenance in the registry if it were implemented; however, 51% are already using an electronic application to capture immunization information and would benefit greatly from integration between the two systems. It was also determined that there are numerous "other" electronic health applications in use by the various stakeholders that would benefit from, and be good candidates for automated data sharing with the immunization registry.

One of these "other" systems is RPMS. A major integration effort would be accomplished along with the initial installation/deployment efforts – the RPMS/registry integration. Because 65% of the children's vaccines administered in the state are captured and tracked in RPMS along with the demographic data, this integration will be critical for the participation and support of the public health community with regards to an immunization registry. This data exchange would be bi-directional, real-time communication (data is not only sent to the registry, but the registry sends data to RPMS). This will then give RPMS users access to records originating from the private providers while at the same time giving the private providers access to records provided by the RPMS user community.

Stakeholders responded to an STC rating process to identify the greatest benefits of a statewide registry, as well as primary concerns. The benefits rated highest were:

- Immediate access to complete and accurate immunization records on all patients
- Reminder/recall functions
- Automatic production of personal or school immunization records
- Automated vaccine inventory and accountability (survey only)

Concerns were all rated at moderate or below. The concerns that received the highest ratings included:

- Available technical support
- Accuracy of registry data
- Data entry workload
- Duplicate data entry
- Cost of registry (interviews only)
- System reliability (survey only)
- Staff turnover and training (survey only)

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Based on the provider input, some of the key features that Alaska should consider in a registry application include:

- User friendly interface with minimal training requirements
- Automated data exchange capabilities – both standard data exchange protocols such as Health Level Seven (HL7) and simple data export file exchanges
- De-duplication – ability to block direct data entry of duplicates, automated de-duplication for batch exports, manual de-duplication and ability to unmerge records merged by mistake
- Record ownership and privacy – ability to assign view only versus add/edit permissions to users and defined public versus private view data elements
- Vaccine forecasting services – forecasting algorithms that are accurate and accommodate changes to the Advisory Committee on Immunization Practices (ACIP) recommended schedule or addition of new vaccines
- Reminder/recall services – based on forecasting algorithms, ability to provide reminders for immunization due or past due notification, ability to limit reminder/recall based on specific vaccine types or lot numbers
- Reports – should include patient listings, coverage by age and immunization series, vaccine accountability, etc.
- Assessments – ability to conduct self-assessments on immunization coverage rates, missed opportunities and missing immunization listings
- Vaccine inventory – ability to track and report on doses received, doses administered, vaccine wasted/spoiled/expired/transferred and doses remaining/ending inventory

Successful implementation and maintenance of a statewide immunization registry will rely heavily on marketing, ongoing communication and support, recruitment of users and retention of users. By clearly understanding stakeholder needs and showing value of the registry functionality through integrating data via automated exchanges from existing systems and ensuring high data quality, registry participation among users will remain high and will ensure registry success.

It is estimated based on comparison of registry experiences in similarly sized states with existing registries that staff needs would range from 2.25 – 3 FTE's. Roles and responsibilities would include program administration/management, marketing, provider recruitment/enrollment, training, technical and user support, data quality monitoring and maintenance of user accounts, server maintenance and installation/upgrades. These positions may be shared among the State Immunization Program, State ITS, local public health offices, registry vendor and/or other contractors.

To sustain a statewide immunization registry and ensure its ongoing success several factors must be considered prior to implementation:

- Legislation – is it needed?

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- Sponsorship
- Oversight committee
- Staffing
- Formal technical support in the form of a help desk
- Implementation schedule
- Provider recruitment
- Parent/community education and coalitions
- Integration

There are barriers unique to Alaska that should also be addressed prior to implementation of a registry:

- RPMS integration (data sharing) with the registry and RPMS data quality issues
- Alaska Native health corporations and data sharing issues
- Remoteness issues due to the Alaska geographic, transportation and communication challenges

Overall, there is a desire among stakeholders to implement a statewide immunization registry. With appropriate funding and stakeholder support, a registry in Alaska is feasible and many components are in place to ensure the success of the system if implemented. The benefits of a registry to Alaska would be significant and would address the various needs of the stakeholders solicited for input on this assessment.

The remainder of this feasibility study provides the detail summarized in this section. It is the intention of STC that this study will serve to provide all the information required for the due diligence process regarding an Alaska immunization registry as well as the basics of a project plan if the decision is made to move forward with the ASIR.

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2.0 Glossary

TERMS	DEFINITIONS
ACIP	Advisory Committee on Immunization Practices
Accountability	Monthly tracking and reporting of vaccine distribution and inventories, doses administered/wasted/spoiled/expired
Accuracy	Data is accurate, correct and complete
AIM	Association of Immunization Managers
AHRQ	Agency for Health Research and Quality
ASIR	Alaska State Immunization Registry
ANMC	Alaska Native Medical Center Data entry is either done at the point of service – as ANMC does for example, or the data entry is done based on hard copies of Patient Encounter Forms. Connected directly to the ANTHC WAN System.
ANTHC	Alaska Native Tribal Health Consortium
CDC	Centers for Disease Control and Prevention, operated under the Department of Health and Human Services (DHHS)
CE	Covered Entity, term used with HIPAA, includes all health plans, health care clearinghouses and health care providers who transmit claims information electronically
CHA/P	Community health aide/practitioner in village clinics
Depot	Vaccine warehouse and primary point of distribution
DHHS	US Department of Health and Human Services
Duplicate Data Entry	Entry of identical data into multiple applications
FERPA	Family Educational Rights and Privacy Act, Federal law that protects the privacy of student education records
Forecasting	Projection of vaccinations due/past due for an individual patient in accordance with the ACIP recommended schedule or other defined vaccination schedule
Functionality	In the context of this study, functionality refers to software applications and a particular method the application offers to accomplish work.
HIPAA	Health Insurance Portability and Accountability Act, governs the use and disclosure of protected health information
HL7	Health Level Seven. A standard protocol for electronically transmitting health care related data between health care providers.
Integration	Ability to incorporate functionality of two or more applications into one single application or interface
Interoperability	Ability to link multiple disparate data applications through electronic transfer of information
IHS	Indian Health Services
ITAAM	Information Technology Alternative Assessment Methodology, model used by STC for conducting systematic assessments
MFI	Multi-Facility Integration module RPMS
NHII	National Health Information Infrastructure
NIP	National Immunization Program, operated under CDC
NIS	National Immunization Survey, an survey conducted by NIP for determining coverage rates for various immunization series among 19-35 month old

TERMS	DEFINITIONS
	children
NVAC	National Vaccine Advisory Committee
PA/NP	Physician assistant/nurse practitioner
PHI	Protected Health Information, term used with HIPAA, encompasses all personal demographic and medical record information
PHIN	Public Health Information Network. A national effort to standardize consistent data exchanges among public health partners through defined data and vocabulary standards
PHN	Public Health Nurse
Private Provider	Any health care provider/clinic funded/operated based on generated revenues
Public Provider	Any health care provider/clinic funded/operated using public grant funding
PVS	Pre-Event Vaccination System. PVS is a national Web-based system developed for the purpose of tracking the responder readiness of each State for an outbreak of Smallpox.
Recall	Notification of patients with vaccinations that are past due or need to be repeated due to manufacturer recall or temperature incident
Reliability	Application is accessible by registry users whenever needed and application is free of bugs/defects
Reminder	Notification of patients when vaccinations are due
RPMS	Resource and Patient Management System, patient information management system designed, maintained and utilized by IHS for American Indian and Alaska Native health service operations. Also in use by Alaska public health centers.
STC	Scientific Technologies Corporation
SWOT	Analysis technique to assess Strengths, Weaknesses, Opportunities and Threats of a given intervention
Third Party Distribution	Use of an outside party to conduct all shipping, receiving and accounting for vaccine inventories
Universal Provider State	State that provides vaccine for all children 0-18 years of age regardless of VFC eligibility status
VFC	Vaccines for Children Program, federally operated program to provide vaccine to underserved populations
VFC Eligible	Any child aged 0-18 years that is American Indian/Alaska Native, Medicaid eligible, uninsured and/or underinsured
VFC Enhancement	Movement to incorporate VFC tracking and accountability into existing registry applications automating the monthly reporting/ordering process
VACMAN	Provider and inventory management system. For more description see Table 4-3.
WIC	Women Infants and Children program
4:3:1:3:3	4 DTaP, 3 Polio, 1 MMR, 3 Hepatitis B, 3 Hib; gold standard series completion for children to be considered up to date, series should be completed by the time a child is 24 months of age

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3.0 Introduction and Background

Much effort, in both the public and private sector, is put forth across the state of Alaska to ensure vaccine is delivered to all residents. The data collected and shared by these efforts is recorded and located in multiple systems that are both electronic and paper based. Alaska lacks a centralized patient immunization record that is accessible by all health care providers and schools across the public and private sectors. Currently, no system exists that consolidates the fragmented immunization record into a single "gold standard."

Lack of a complete, consolidated immunization history affects health care providers, school and child care personnel, and parents/patients. Health care providers require complete records to ensure that patients receive needed vaccinations in a timely manner and are not over-immunized with unnecessary or duplicate vaccinations. School and child care personnel must have accurate records in order to meet immunization requirements and to protect the health and well-being of others in their care. Parents/patients must have access to complete immunization histories to prepare for school/college, sports participation, international travel and medical visits throughout the life cycle. Further, when paper records are misplaced or incomplete, valuable time and staff resources are expended to compile information, or vaccinations are repeated leading to unnecessary costs and over vaccination.

Statewide, and possibly nationwide, immunization registries have the ability to store consolidated records which can be easily accessed by health care providers, school and child care personnel, as well as parents/patients. Registries also have the ability to provide forecasting for vaccinations due, generate reminder/recall notices and assist health care providers with monthly/annual reporting requirements.

STC was hired to conduct a Needs Assessment and Feasibility Study for a statewide immunization registry system in Alaska. The intent was to evaluate whether a statewide registry can help overcome some of the challenges and issues facing Alaska in terms of tracking, monitoring and recording immunization encounter information. The primary deliverable for this project is a report detailing:

- Results of stakeholder interviews and a statewide provider survey conducted by STC
- Analysis regarding the feasibility of registry establishment in Alaska
- A basic plan for consideration (including projected timeframes and cost estimates) for establishment of a statewide electronic immunization registry
- The document that follows addresses these requirements.

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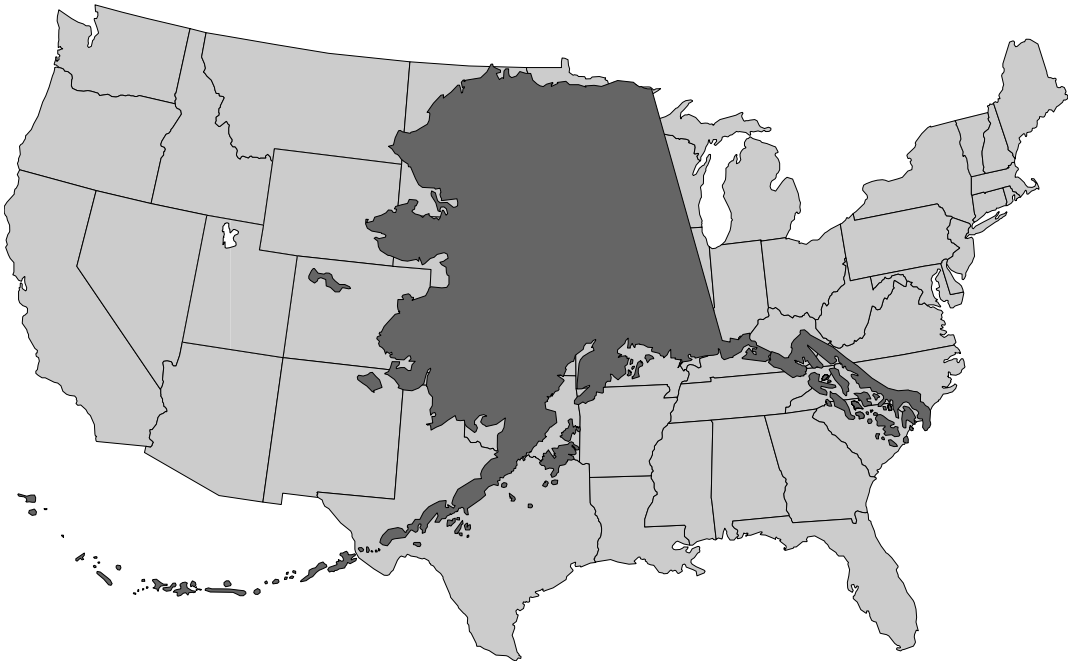
3.1 General Issues

Alaska is the largest state in the union at 586,412 square miles, equivalent to 1/5 of the total land mass of the United States. The following map illustrates this contrast.

Figure 3-1: Comparison of Land Mass of Alaska and the Contiguous United States



Alaska's extensive public health system is operated through the Department of Health and Social Services and Alaska Native health corporations and is designed to provide basic healthcare services to residents throughout the state. The state is well connected with extensive internet connectivity, wide area networks linking people statewide, and advanced Telemedicine capabilities. Transportation is available, though occasionally limited and expensive, ensuring that health care providers have access to even the most remote villages.

There are 29 birthing centers in the state, 13 of which are hospitals. Approximately 5% of births take place in the home. Most hospitals administer hepatitis B at birth, but this information is not currently recorded on the electronic birth record.

The public health infrastructure is divided into four primary regions: Interior, Southcentral, Southeast and Southwest. This system is composed of 26 public health centers/offices, including 4 public health centers supported with state grant assistance. The following maps illustrate the regional distribution of these public health centers and the primary itinerant nursing hubs.

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Figure 3-2: Alaska Public Health Nursing Regions and Grantee Public Health Centers

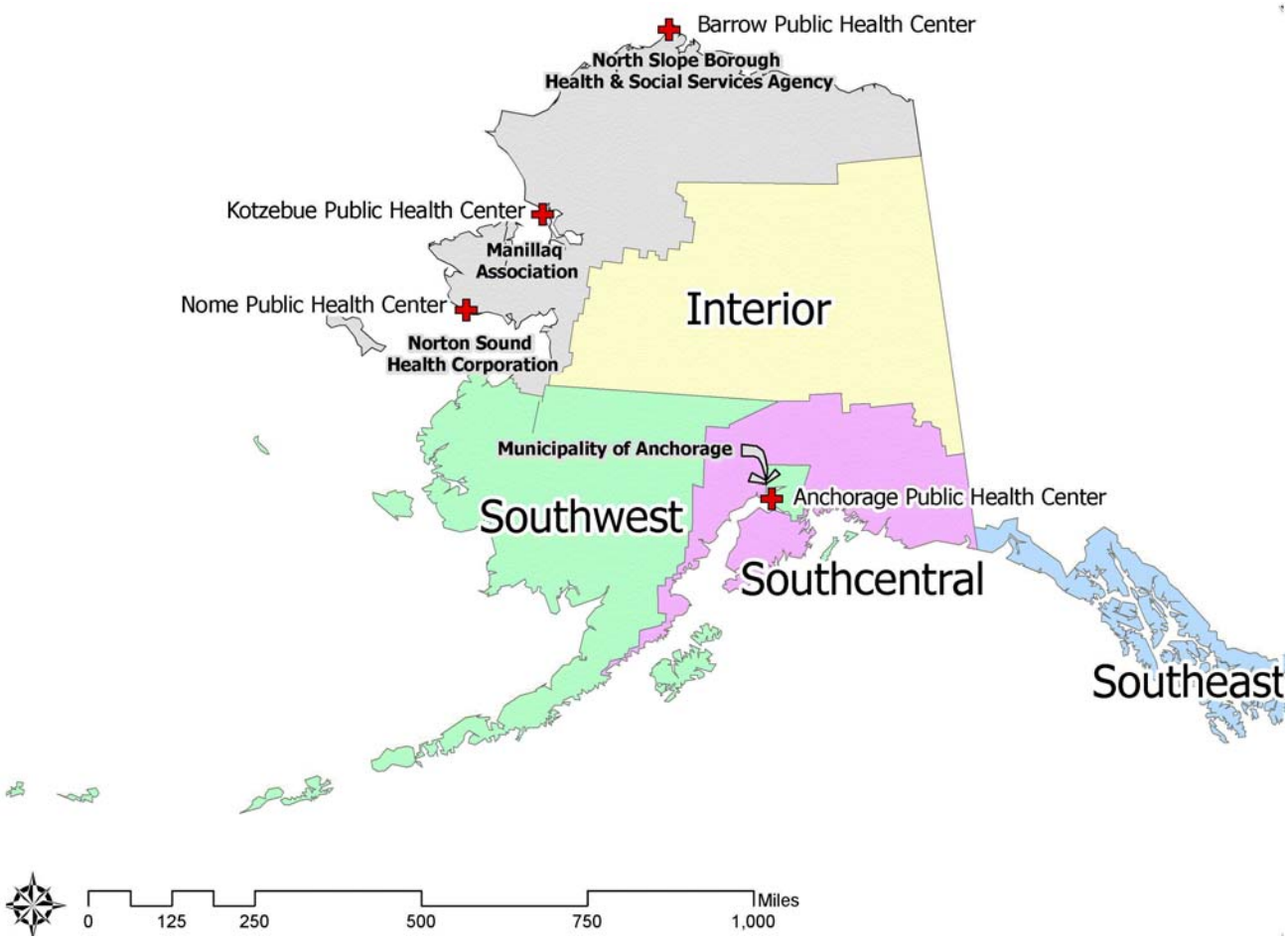

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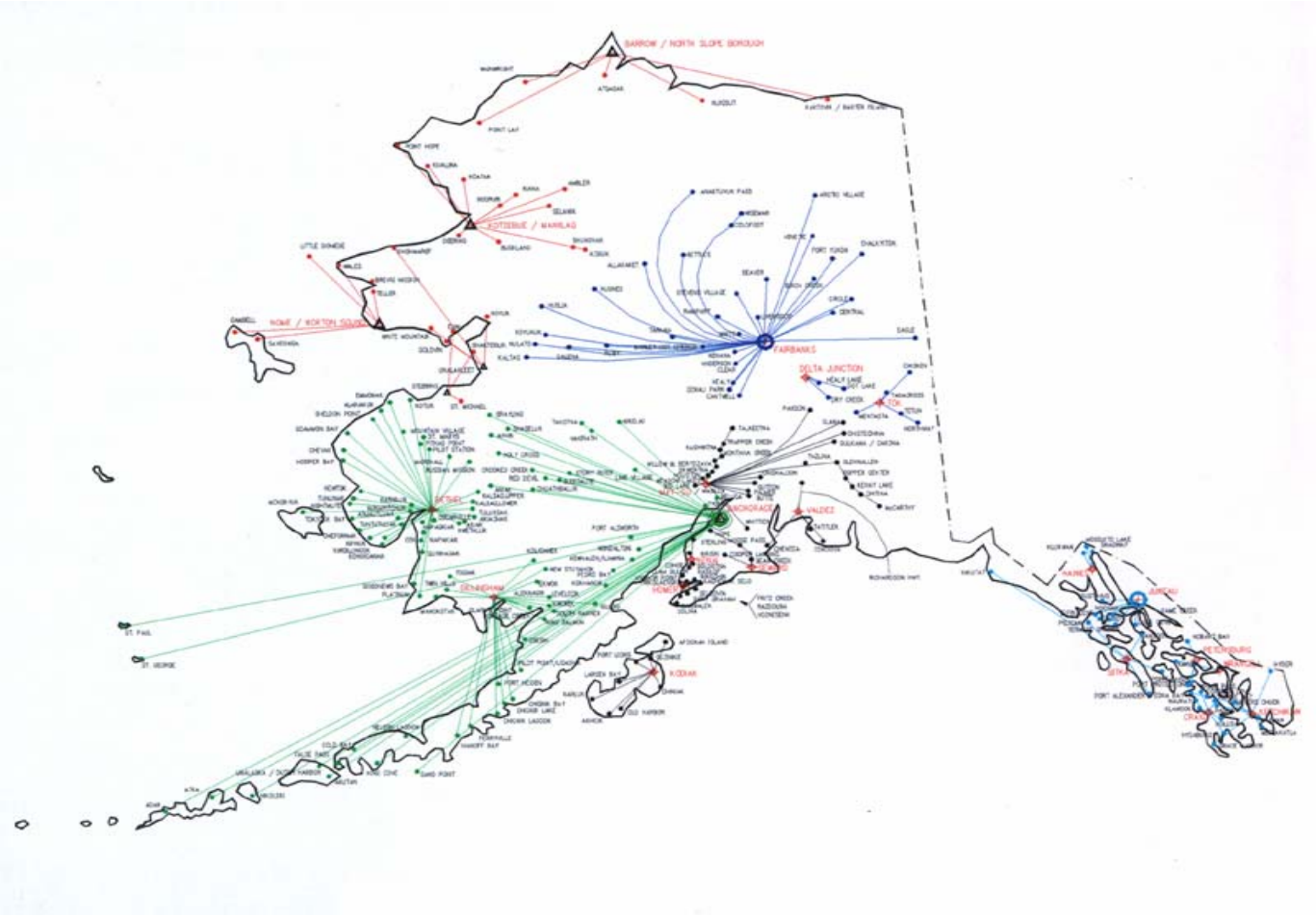
Figure 3-3: Alaska Primary Itinerant Nursing Hubs and Service Distribution Patterns



The Alaska Native health corporations provide health care under contract or compact with the Indian Health Service (IHS). There are currently 39 facilities that provide health services under the 12 corporations. The following maps illustrate how the corporations are divided and typical referral patterns for hospitals, physician (MD) health centers, physician assistant/nurse practitioner (PA/NP) health centers and community health aide/practitioner village clinics (CHA).

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Figure 3-4: 12 Alaska Native corporations under contract or compact with IHS

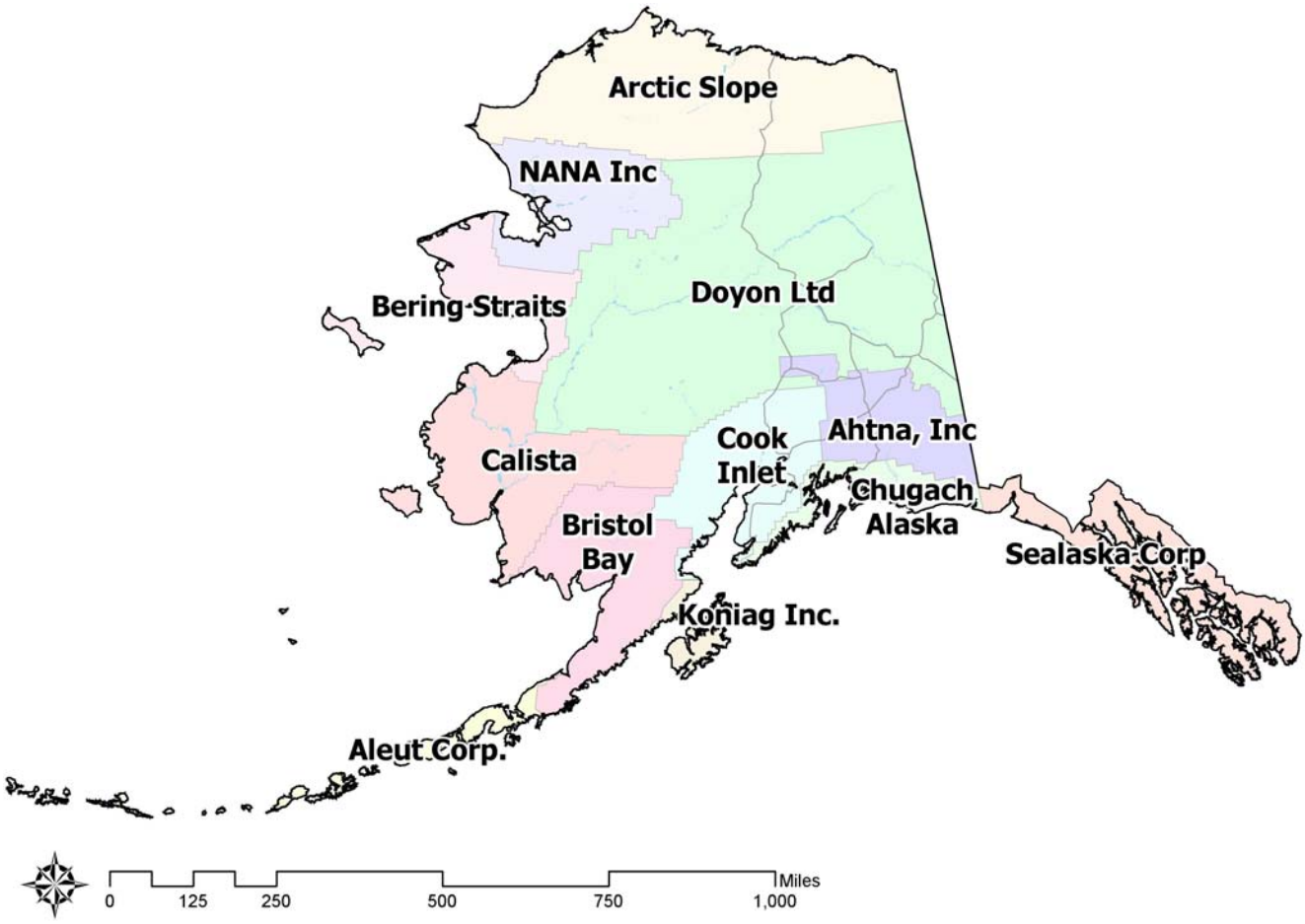

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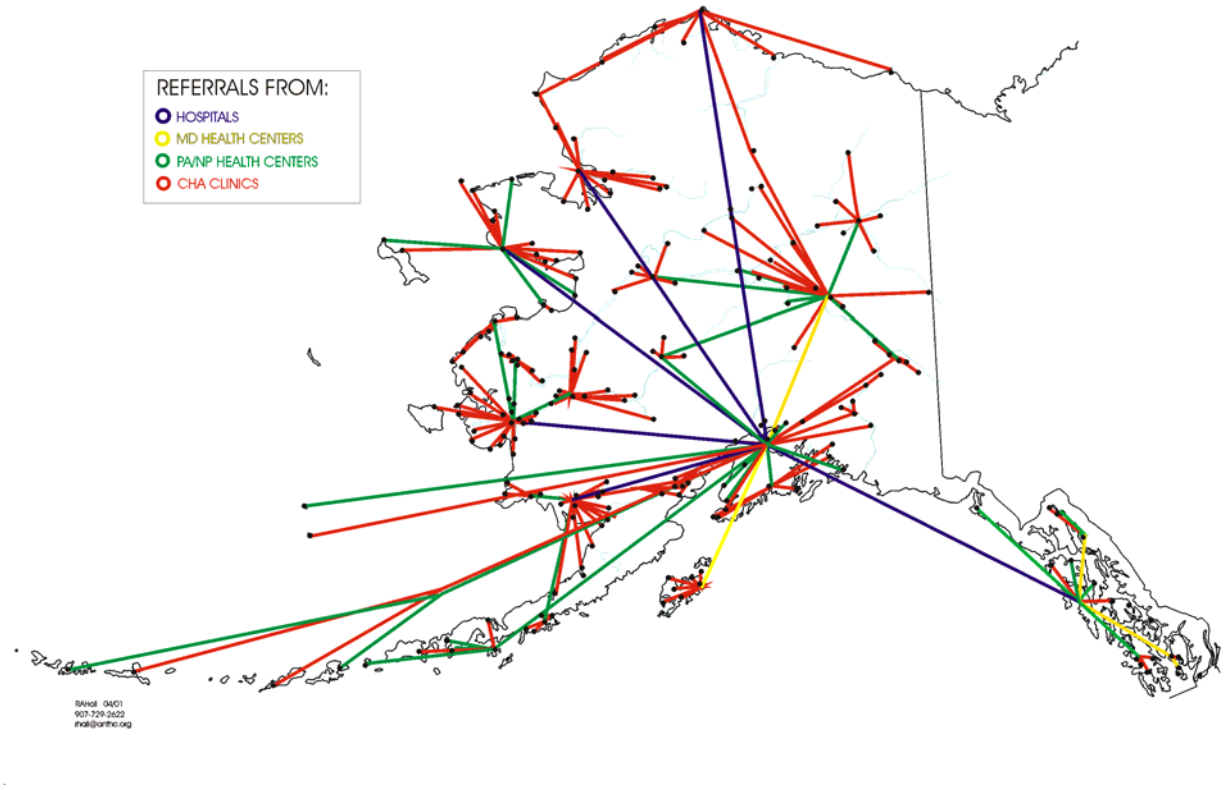
Figure 3-5: Alaska Native health corporation typical service referral patterns



Both the public health nursing facilities and tribal corporations maintain the RPMS database with vaccination and medical information on all patients served. Individual tribal corporations establish policies on sharing data with outside agencies and/or healthcare providers; all decisions go through corporation leaders and legal departments.

There are 35 WIC sites in the state, 11 of which are co-located with the public health nursing facilities. WIC staff review immunization histories during certification and recertification visits and refer children for vaccinations as needed. Some larger school districts also perform some healthcare functions by utilizing school nurses to provide vaccinations and other services to students and families. These schools maintain a database that tracks both immunizations administered and historical vaccinations for all students.

There are also four major military bases in Alaska: Elmendorf AFB and Fort Richardson in Anchorage, and Eilson AFB and Fort Wainwright in Fairbanks. Military children attend public

schools and receive medical care both on and off base. Children seen by military providers are entered into and tracked by the military healthcare database.

3.2 Vital Stats/Population Demographics

The state of Alaska is home to over 655,000 residents with an annual growth rate of 1.1% (Alaska Department of Labor and Workforce Development, provisional estimate 2004). Annual births to residents are approximately 10,000 births/year at a birth rate of 15.9%. Alaska is ranked 48th among states for total population, ahead of Vermont and Wyoming.

Sixty-six percent (66%) of the population in Alaska reside in areas classified as urban. The major population centers are Anchorage (277,498), Fairbanks (84,979), Matanuska-Susitna Borough (70,148), Kenai Peninsula Borough (50,980) and Juneau City/Borough (30,966). The remaining 44% reside in areas designated as rural or frontier.

Because Alaska is the most sparsely populated state at 0.4 persons/square mile, communication, transportation, education, healthcare and basic services are often a challenge to support and require access to advanced technology, or residents may forgo many of these amenities.

The majority of Alaska residents are Caucasian and Alaska Native. The following chart illustrates population by race.

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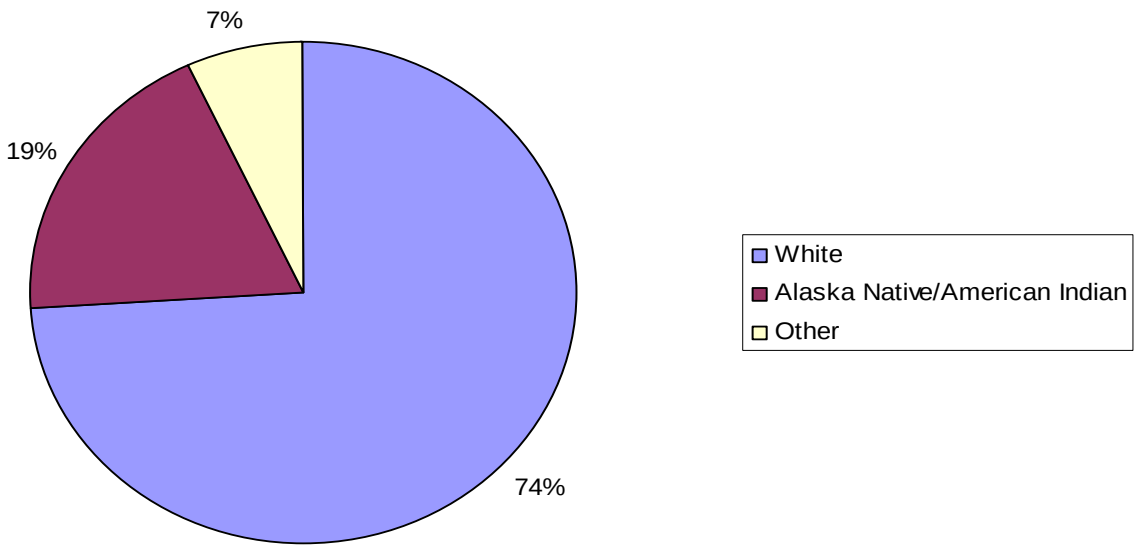
Figure 3-6: Alaska population by race 2003 US Census Data (n = 655,435)



Tracking the Alaska population presents several challenges. Residents are often transient, moving among cities and villages following seasonal employment opportunities. In rural Alaska, adoption occurs frequently within family units, along with frequent name changes among individuals. Many new residents move to Alaska as a result of military assignment to one of Alaska's four military bases or by moving from states such as Washington, Idaho and Montana.

3.3 Current Immunization Status in Alaska

Alaska is a universal vaccine provider state, ensuring that all children in the state, regardless of insurance, economic or racial background, have access to all recommended childhood vaccinations. The Alaska Immunization Program distributed nearly 400,000 doses of vaccine to public and private providers in 2003 valued at over six million dollars. All vaccine except varicella is distributed directly from the state Vaccine Depot (storage warehouse) in Anchorage to participating providers. On occasion, schools, tribal health facilities and itinerant nursing facilities serve as sub-depots (intermediate distribution points) to assist with distribution of vaccine to very remote clinics and villages. At this time, there is no third party distribution/shipping of vaccine beyond the Vaccine Depot, with the exception of varicella vaccine which is shipped directly from the manufacturer to certified providers.

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In 2003 there were 236 providers participating in the state vaccine program. It is estimated that essentially all pediatricians and family physicians in the state take advantage of the program. These providers administered 258,585 doses for selected antigens. Using "Doses Administered" data, the providers can be divided into classes based on volume of immunizations administered. The following table illustrates this breakdown.

Table 3-1: Provider breakdown by category determined by year end doses administered data, 2003 (n = 236)

CLASS	DOSES ADMINISTERED	NUMBER OF PROVIDERS IN CLASS
"Mega" Provider	≥ 10,000	3
Large	5,000 – 9,999	14
Medium/Large	1,000 – 4,999	35
Medium	500 - 999	30
Small/Medium	100 - 499	95
Small	1-99	59

Total doses administered can also be broken down to compare volume by public and private vaccine providers. The following figure illustrates this comparison.

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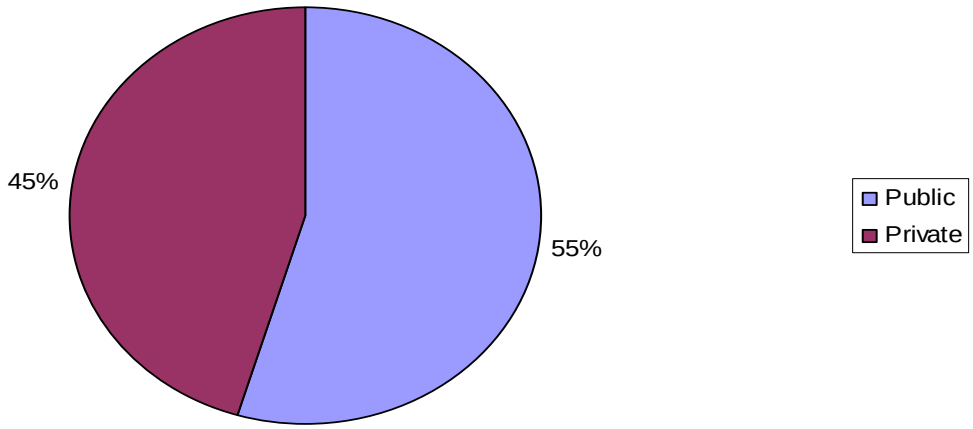
Figure 3-7: Reported doses administered by public versus private providers. 2003 (n = 258,585)



As demonstrated in the pie chart, the majority (55%) of doses are administered in public clinics, versus 45% in private provider clinics.

Of the estimated 205,483 Alaska children between 0-18 years of age, 124,851 (61%) were classified as VFC eligible as reported in the 2005 Population Estimates and Project Information prepared by the Alaska Immunization Program. The following chart depicts the distribution of VFC eligibility for the target population.

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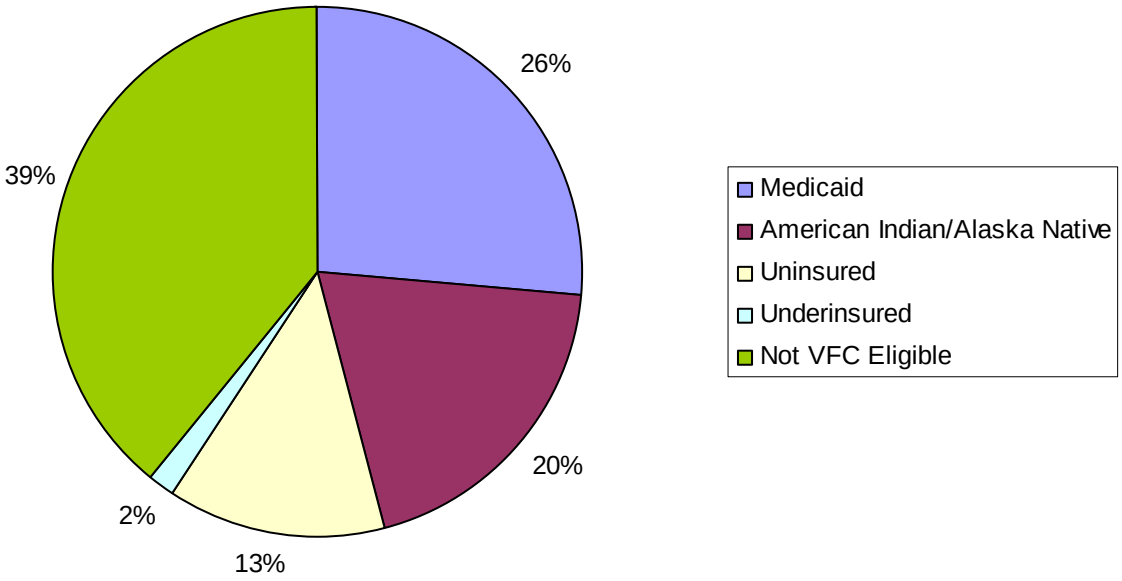
Figure 3-8: VFC eligibility estimates for Alaska children aged 0-18 years (n = 205,483)



As shown, the majority of VFC-eligible children are non-Alaska Native Medicaid eligibles (26%) or American Indian/Alaska Native (20%).

According to the National Immunization Survey (NIS, CDC) for CY 2003, the Alaska statewide estimated completion rate for the 4:3:1:3:3 (4 DTaP, 3 Polio, 1 MMR, 3 Hepatitis B, 3 Hib) series among children 19-35 months was reported at 79.7% (national average: 79.4%). Among other states, Alaska ranked 27of 51 (includes District of Colombia) for immunization rates in this series. The figure below illustrates trending for Alaska in the 4:3:1:3:3 series from 1999 – 2003 as compared to the national average.

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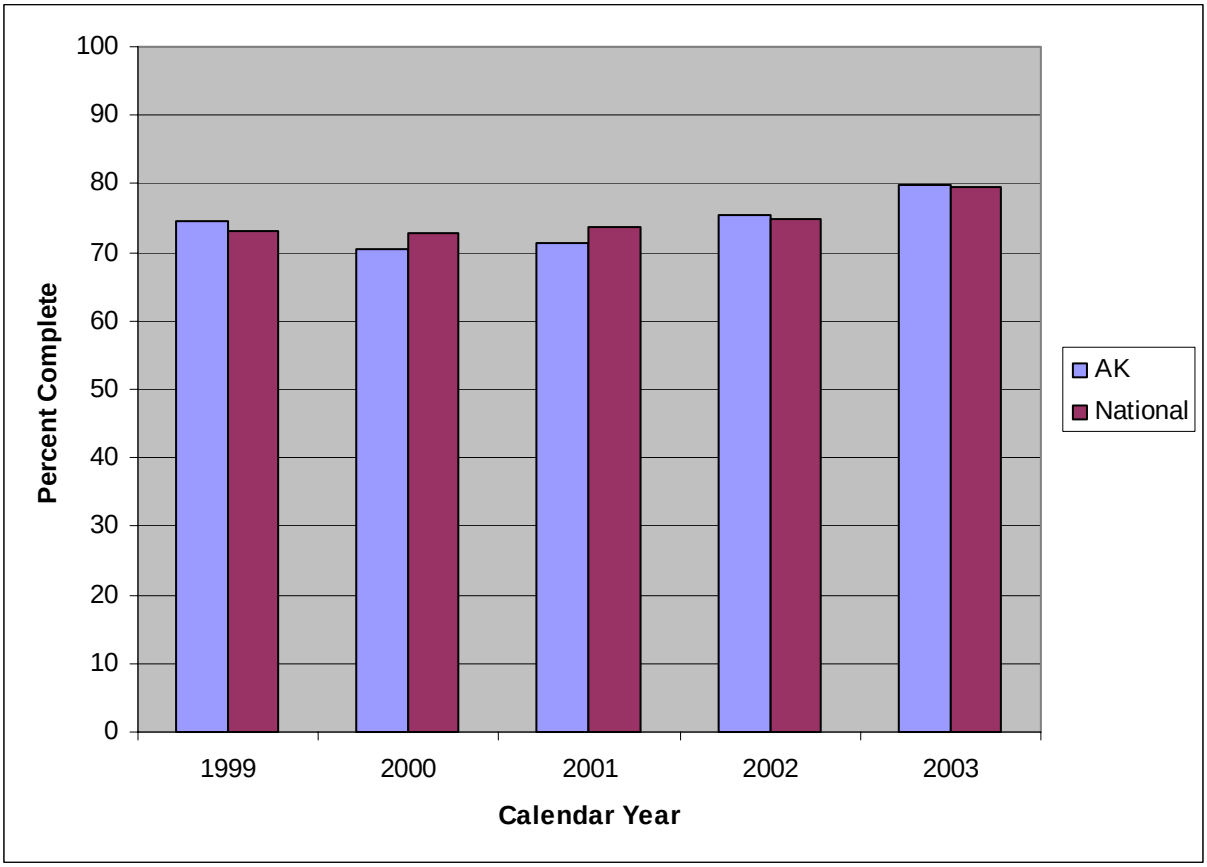
Figure 3-9: NIS rate trending comparison for Alaska and National averages for 4:3:1:3:3 completion from 1999-2003



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4.0 Assessment Results

STC utilizes a methodology for conducting assessments called the Information Technology Alternative Assessment Methodology (ITAAM). ITAAM is comprised of flexible components designed to be modified to fit the requirements of the subject to which it is being applied. ITAAM consists of several phases, each containing tasks and interim deliverables. Each of these is described in the table below.

Table 4-1: Description of ITAAM Phases, Tasks, and Deliverables

PRIMARY ITAAM PHASE	ASSOCIATED TASKS	INTERIM DELIVERABLE(S)
Introductory & Discovery	• Kickoff meeting • Develop/customize data collection instruments • Interviews and data collection • Review existing documents • Document and distribute interviews	• Kickoff presentation • Data collection instruments • Documented/edited interviews
Needs & Requirements Assessment	• Assess existing processes • Assess support structure • Analyze and categorize issues across groups (if applicable) • Investigate relevant national public health initiatives • Prepare needs & requirements portion of the final report	• Illustrate and describe existing process • Illustrate and describe existing technical environment • Issues assessment and analysis • Discuss relevant national public health initiatives • Deliver needs and requirements portion of the final report
Conceptual Design	• Isolate key areas of focus • Assess data flow alternatives • Assess IT infrastructure alternatives • Prepare conceptual design portion of the final report	• Conceptual procedural design alternatives • Conceptual technical design alternatives • Deliver conceptual design portion of the final report
Final Report	• Develop recommendations relative to issue categories • Develop an estimated phased implementation plan with specific tasks / objectives • Create final report • Create final presentation	• Final report • Final presentation

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During the needs and requirements phase of the Alaska assessment, information was gathered from three primary sources:

- User interviews/surveys
- Existing documents
- Research on national public health initiatives

Based on these information sources, a conceptual design was developed which outlines and illustrates desired outcomes. Corresponding recommendations were established to address barriers associated with existing processes and technologies in order to optimize Alaska's ability to participate in current and future national public health initiatives.

4.1 Documented Interviews

STC conducted 32 interviews and received input from 42 primary stakeholders who provided diverse perspectives on the benefits, concerns and barriers associated with the consideration/implementation of a statewide immunization registry in Alaska. Interviews were conducted between the dates of 9/20/04 and 12/14/04. Those interviewed included a variety of programmatic and information and technology staff from the Alaska Department of Health and Social Services, Alaska Native health corporations, public health and school district nurses, and physicians from a sampling of large and small volume clinics throughout the state. STC project staff conducted most of the interviews onsite, while three were conducted over the phone.

For a list of interview participants, their organizations, locations and titles, refer to Appendix 7.1. A discussion of the interview findings is presented in section 4.4.1. The interview tool can be reviewed in Appendix 7.2.

4.2 Provider Questionnaire

Alaska Immunization Program staff mailed a survey questionnaire developed by STC to all providers participating in the state vaccine program. The survey, an abbreviated version of the questionnaire used for the in-person interviews, provided further understanding of vaccine providers' capabilities, attitudes and interest/concern surrounding the possibility of a statewide immunization registry. A total of 249 surveys were disseminated, and 57 responses (23%) were received in time to be included in the analysis. Survey responses were entered into an electronic survey analysis program. A discussion of the survey results is presented in section 4.4.2. The survey tool can be reviewed in Appendix 7.3.

4.3 Review of Existing Documentation

In addition to stakeholder interviews and provider survey responses, research was done on current national public health initiatives in relation to statewide immunization information

systems, state/local immunization programs and vaccine management. Areas researched included:

- National Goals for Immunization Registries
- VFC Enhancement Efforts
- Integration and Interoperability Efforts
- HIPAA and Immunization Registries
- PHIN and Immunization Registries

This information is presented in detail in section 4.4.3.

4.4 Outcomes of Interviews, Surveys, and Documentation Reviews

Information from the in-person interviews, telephone interviews, surveys and documentation is summarized in this section through textual descriptions and aggregate counts of interviewee responses. The outcomes from this phase of the feasibility study were instrumental in identifying the barriers, challenges, cost-versus-benefit discussions and recommendations that comprise much of the report following this section.

4.4.1 Interview Summaries

The purpose of the stakeholder interviews was to develop an understanding of the technical infrastructure, capabilities and attitudes of those associated with operating immunization programs and administering vaccine in the State of Alaska. Though a structured interview tool had been developed, the majority of the interviews were conducted in a more conversational format. The format encouraged a meaningful exchange of key information, but when coupled with the extensive diversity of the individuals interviewed, made generalizations of interview comments challenging. The following table provides an overview of the most commonly mentioned issues that vaccine program staff and vaccine providers face in providing immunization services to Alaska residents. Any comment received in more than four interviews was included in the table below. Note: the comments received during the interview phase are based on the perceptions and experiences of the individual(s) being interviewed and may not be a true representation of immunization programs/practices in Alaska.

Table 4-2: Summary of most frequent comments received during stakeholder interviews (n=32 interviews)

DESCRIPTION	FREQUENCY
Recording and reporting processes are paper based, time consuming	16

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DESCRIPTION	FREQUENCY
Families very mobile/names change a lot (rural/military)	11
Concerns over RPMS functionality and data quality	11
No access to RPMS data for private providers, schools or state vaccine depot	9
Vaccination records fragmented, multiple providers	9
Monthly reports run using RPMS or Patient Management/Billing System	8
Internet access limited especially in small practices and in remote areas	7
Providers not allowed to share records directly with schools - law prohibiting sharing student information without written consent from parents (FERPA)	7
Security/confidentiality issues with regard to data sharing, especially as it relates to RPMS	7
Lots of time spent by school nurses and physicians to track down fragmented vaccination records	7
Data entry backlogs in RPMS due to staff turnover/shortages and not being a priority	6
Not all historical data is getting entered into RPMS, leading to partial records	6
Over immunization is a perceived problem	4
Providers are slow to respond or don't respond to requests for immunization records from public health offices or schools	4

Other comments mentioned include issues with the military and sharing records between on- and off-base medical providers, problems with data sharing between some PHN sites, limited number of providers in the rural communities, high staff turnover, limited computer skills among staff and large populations of uninsured and under insured patients. Numerous, miscellaneous comments were also made regarding the RPMS application, including the fact that changes in the application are difficult to implement, not all providers are using the same version of RPMS, and there are many duplicate and incorrect records in the system.

Those interviewed were asked which electronic applications being used in their program/practice had an immunization component or would possibly benefit from integration with an immunization registry. The following table provides an overview of the applications mentioned and their primary uses/capabilities.

Table 4-3: Summary of electronic applications in use by interview participants

APPLICATION	DESCRIPTION	FUNCTIONS
RPMS	Patient Management System in Public Health/Native Corporation offices	• Electronic medical record • Estimated to contain 65% of all Alaska children between the ages of 0-6 years, and 90% of all Alaska Natives • Has immunization component but no inventory management feature • Data exchanged with Phoenix RPMS database and Multi-Facility Integration (MFI) database

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APPLICATION	DESCRIPTION	FUNCTIONS
		• Vital Stats data not captured • WIC access but no data exchanged between systems • Does not capture vaccine expiration dates, CPT codes, contraindications, adverse events, dose volume or injection site
ImmAGE	Coverage rate assessment application	• Used in place of CASA in private facilities
Self ImmAGE	School and childcare facility immunization assessment tool	• Database for immunization histories Can accept data exports from RPMS
AUAS – Audit Assessment System	School and childcare facility database	• Tracks schools and licensed childcare facilities statewide • Immunization compliance, audit schedules, generation of school forms
Immunization School Assessment and Goal Evaluation Module in Comprehensive Information Management for Schools	Immunization assessment tool used by some school districts	• Captures doses administered by school nurses • Maintains historical vaccinations for all students • Calculates compliance and forecasting • Generates letters and annual reports
VACMAN	Vaccine provider and inventory management system	• Used for all vaccine inventory and accountability functions • Used for VFC/AFIX visits to pull clinic profiles and accountability reports • Lots of problems with latest VACMAN release
VitalVision	Vital Statistics application for tracking birth/death records	• Supplies both birth and death records • Shares data with Child and Family Health and Epidemiology Sections
AKWIC	State WIC client management application	• No data shared with other applications • Central database for view only access • Records downloaded to local servers for edit capabilities
Birth Defects registry	Statewide birth defects tracking application	• Shares data with Medicaid • Stores birth certificate number from Vital Statistics • All data received from claims, providers perform no manual entry
Electronic Medical	Private physician	• Similar functionality to RPMS application

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APPLICATION	DESCRIPTION	FUNCTIONS
Records/Patient Management Systems/Billing Systems	systems for recording patient demographic and medical information	• Functionality varies by vendor • Most include vaccination date and type by CPT code • Most do not include manufacturer, lot number, VIS date, site, route and expiration date • Most do not provide forecasting, reminders, invalid dose notification or inventory management capabilities • Most have functional exports only for insurance companies • Applications in use by those interviewed: NextGen, QS Technology, Insight, Medical Manager (3), MedEase, MediMac, E-Clinical Works, MegaWest

Interview participants provided extensive commentary on benefits and concerns along with additional suggestions and considerations of statewide registry implementation. A table summarizing these comments can be found in Appendix 7.4, Interview Comments. In general, those interviewed perceived the greatest benefits of a registry to be access to complete/accurate immunization information on all patients, reminder/recall capabilities and automatic production of immunization records. Participants were most concerned about cost, confidentiality and data sharing issues, staff resources for data entry, potential for integration with existing systems and what functionality a registry could offer them in their practice or immunization program.

Overall, the majority of those interviewed agreed that implementation of a statewide immunization registry would be beneficial to themselves and other state efforts. Participants felt that computer equipment, internet connectivity and staff computer literacy were generally adequate or could easily be updated to become adequate if a registry were to be implemented.

4.4.2 Survey Summaries

A total of 57 responses were received to the statewide written survey. The following section summarizes provider responses to the survey questions. The survey tool can be reviewed in Appendix 7.3. **Note: the denominator (n) may vary in cases where individuals elected to skip particular survey questions.**

As demonstrated in the following chart, the majority of responses came from family practice clinics, followed by public health and “other”. Other included hospital based clinics, teen homes, drug treatment facilities, and miscellaneous adult/out patient service clinics.

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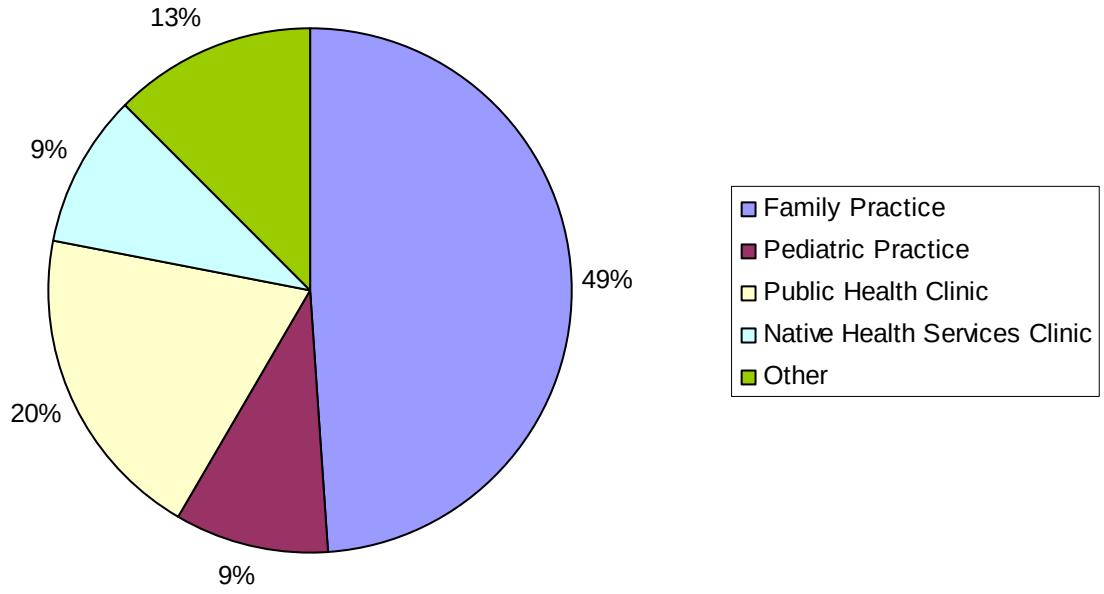
Figure 4-1: Survey responses received based on organization type (n=55)



Of those surveyed, 48/57 (84%) maintain at least one computer (range: 1-50) that is available for patient care, as demonstrated in the flow chart below.

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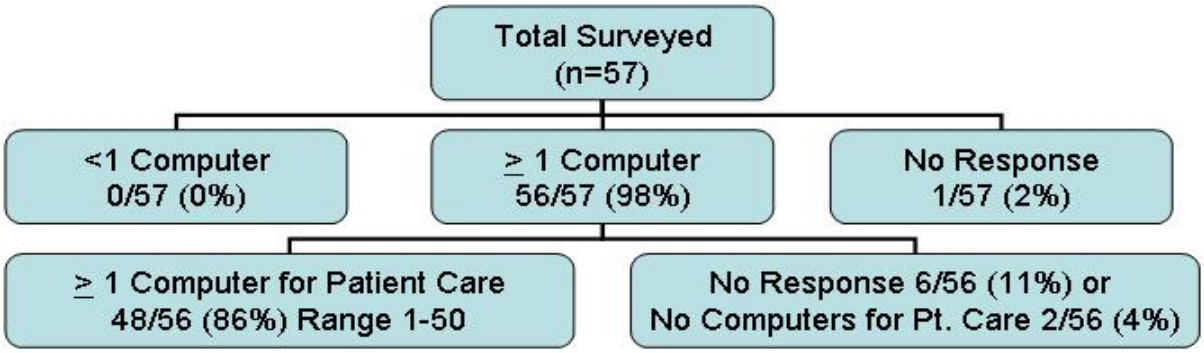
Figure 4-2: Providers maintaining one or more PCs in office and number of PCs available for patient care (n=57)



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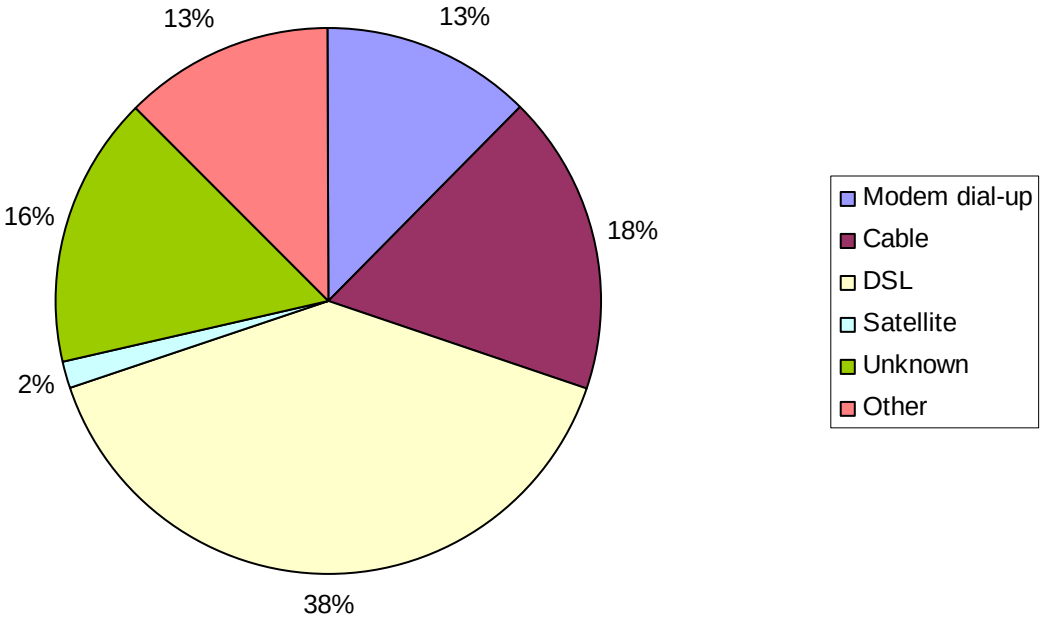
Of those responding, 56/57 reported having some form of Internet access. The following chart illustrates which types of connections are being used, with DSL and cable being the most common.

Figure 4-3: Type of internet connection in use by survey respondents (n=56)



When asked to rate connection speed, 30/55 (55%) prescribed a rating of very good, 18/55 (33%) rating of good and 7/55 (13%) rating of poor. Overall, 48/55 (88%) rated connection speed at good or better.

About half of those surveyed, 29/56 (51%), utilize some form of an electronic system to capture patient demographic and vaccination information. The following chart depicts the types of systems/applications in use, with electronic medical record being the most common.

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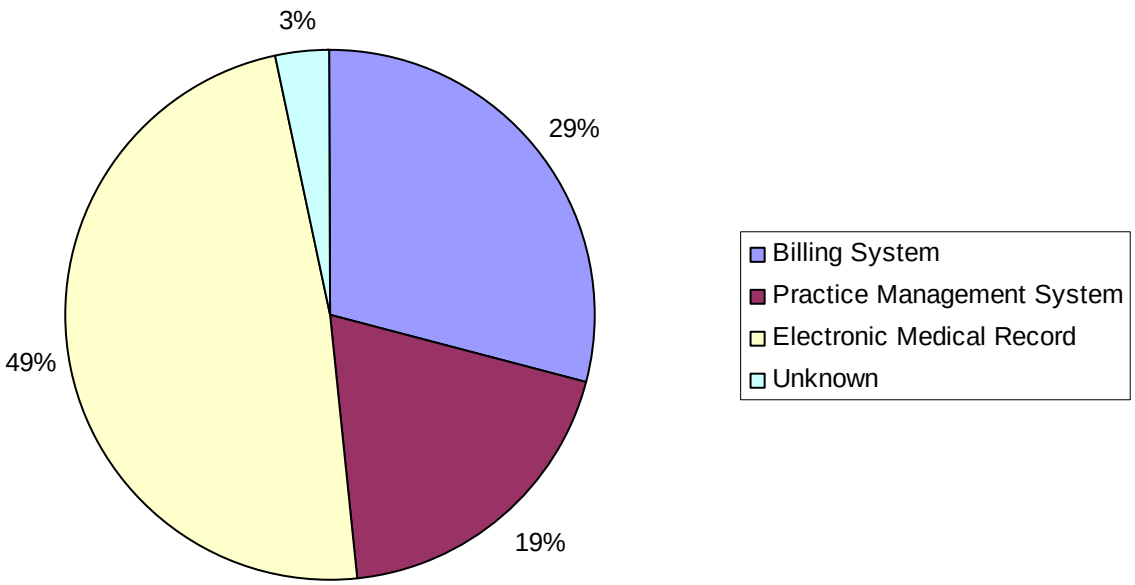
Figure 4-4: Type of electronic application used to capture patient demographic and vaccination information (n=31)



When asked to name which systems were being used, RPMS 12/31 (39%) and Soapware/Lytec 4/31 (13%) were most frequently mentioned. Eleven other applications were noted including Medical Manager, Medisoft, Misys, E-Clinical Works and Practice Partner. A full detailing of which applications were listed can be found in Appendix 7.5.

The following table details methods used to remind and schedule patients for immunizations and the frequencies with which they were reported. Actual responses can be reviewed in Appendix 7.6.

Table 4-4: Methods used for immunization reminders and scheduling as reported by survey respondents (n=54)

DESCRIPTION	FREQUENCY
Remind at time of visit/appointment and/or write on immunization record	22
Use tickler system and send postcards or reminder letters	17

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DESCRIPTION	FREQUENCY
Patient responsibility	5
Use RPMS to generate list or reminder letters	4
Use other electronic application to generate list or reminder letters	3
Based on memory	2
Conduct manual chart review and notify those due	1

The majority of approaches for immunization reminder/recall are based on a manual effort to identify and notify patients when vaccinations are due. Only 7/54 (13%) of those surveyed are using some sort of an electronic application to help identify patients and generate reminder letters/mailing labels. Over half 29/54 (54%) of those responding do not perform any active reminder efforts and rely on passive approaches or patient responsibility.

The following table details methods used to recall patients for immunizations in the event of a temperature incident or manufacturer recall and the frequencies with which they were mentioned. Actual responses can be reviewed in Appendix 7.6.

Table 4-5: Methods used for vaccine recall efforts as reported by survey respondents (n=52)

DESCRIPTION	FREQUENCY
Perform manual chart or log review for patients receiving affected lot number(s)	27
Use electronic application other than RPMS to generate list for recall	11
Call or send letters only to patients assumed to be affected	8
Use RPMS to generate list for recall	6

Thirty-three percent (33%), 17/52, of those responding to the question on recall efforts were using some electronic application, RPMS or otherwise, to generate a recall listing and contact information. The remaining practices rely on manual efforts to identify and recall affected patients.

Those surveyed were asked to assign a subjective rating to a variety of common benefits and concerns related to implementation of immunization registries. Average ratings for benefits are presented in the table below. Responses were based on a 5-point scale: 5 = very important; 1 = not important.

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Table 4-6: Common registry benefits – subjective rating (n=56)

BENEFITS	AVERAGE RATING	RANGE OF RESPONSE
Immediate access to complete, current immunization information on all patients	4.7	1-5
Automatic production of personal, school and child care immunization records	4.5	1-5
Automated vaccine inventory and accountability	4.3	2-5
Reminder/recall functions	4.1	1-5
Past due notification	4.1	1-5
Immunization forecasting	3.8	1-5
Assessing clinic immunization coverage levels	3.7	1-5

Additional benefits listed as "other" included decreasing inappropriate vaccination/over immunization and missed opportunities, time savings for recall efforts during temperature incidents or manufacturer recalls, possibilities to meet objectives of other health maintenance programs, and elimination of issues with RPMS and data sharing challenges.

Participants were also asked to rate their feelings on common registry concerns. Average ratings for concerns are presented in the following table. Responses were based on a 5-point scale: 5 = very concerned; 1 = not concerned.

Table 4-7: Common registry concerns – subjective rating (n=55)

CONCERNS	AVERAGE RATING	RANGE OF RESPONSE
Registry technical support	3.5	1-5
System reliability (minimal downtime)	3.3	1-5
Accuracy and reliability of data	3.2	1-5
Duplicate data entry	3.2	1-5
Data entry workload	3.0	1-5
Staff turnover and training	3.0	1-5
Patient confidentiality	2.4	1-5

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CONCERNS	AVERAGE RATING	RANGE OF RESPONSE
Lack of computer equipment and/or software	1.9	1-5

In general, most areas were rated to be of moderate concern. Additional concerns listed included lack of time and level of provider participation.

Responses varied significantly in the amount of time that providers were willing to devote to the searching/updating of patient records and entry of new patients. The table below summarizes survey responses.

Table 4-8: Hours per month that survey respondents would be willing to spend on entry/search/update of patient records in an immunization registry application (n=43)

RANGE	FREQUENCY
0 hours	4
1-5 hours	30
6-10 hours	2
25-45 hours	5
Whatever is needed	2

The majority of the providers responding, 30/43 (70%) would be willing to spend 1-5 hours per month on maintaining patient records in the registry. As follow up to this question, providers were asked if this information was already being captured electronically in another application and whether their practice would benefit from electronic transfer of patient/immunization records through integration with an immunization registry. The following diagram details responses received.

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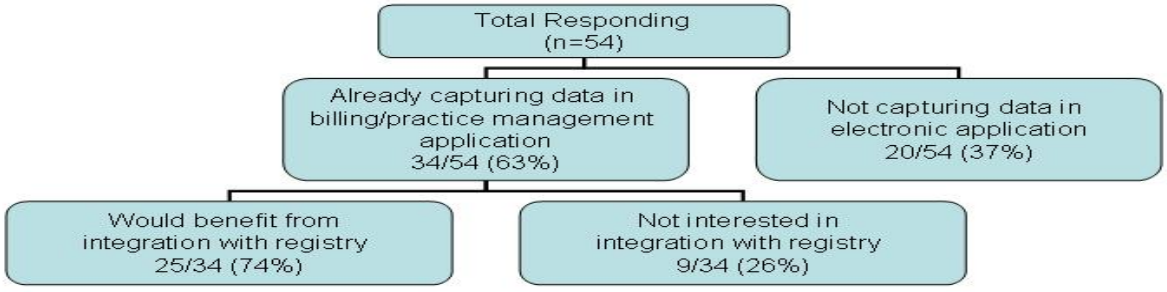
Figure 4-5: Providers utilizing billing/patient management systems and interested in integration with a statewide immunization registry (n = 54)



The final survey question asked participants to indicate their level of agreement that participation in a statewide immunization registry would be beneficial to them as a vaccine provider. Responses were limited to strongly agree, moderately agree and do not agree. Of those responding, 36/55 (65%) strongly agreed that a registry would be beneficial to their practice, 16/55 (29%) moderately agreed, and 3/55 (6%) stated that they did not agree that a registry would be beneficial. Overall, 52/55 (94%) of those responding to the survey felt that a registry would be a valuable addition to their immunization program. Additional, miscellaneous comments from collected surveys regarding implementation of a statewide immunization registry can be viewed in Appendix 7.6.

4.4.3 Existing Documentation Review

There are several national initiatives underway related to statewide immunization registries. A plan for compliance with emerging efforts and technical standards should be prioritized based on the business needs of the Alaska Department of Health and Human Services. The most prominent efforts are detailed in the following section. For more information on these initiatives, refer to Appendix 7.7 for a list of references.

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National Goals

On the national front, Healthy People 2010 established a goal that by 2010, 95% of children aged 0-6 years will be entered into a fully operational, population-based immunization registry[1]. The Centers for Disease Control and Prevention (CDC), National Immunization Program (NIP) is committed to this goal and has established an additional goal that every state will have a fully functional statewide registry in order to achieve the 2010 objective. The "Immunization Registry Strategic Plan 2002-2007" was established to help guide NIP and State Immunization Program activities toward achieving this objective[2].

Further, as a requirement under USDA, WIC programs are required to screen and refer patients for up to date vaccinations. A White House Executive Memorandum was issued in December 2000 directing WIC to screen the immunization records of all infants and children under the age of two at WIC certification/recertification visits[3]. WIC staff review immunization histories, when available, and provide referrals to immunization services as needed. Numerous efforts are underway to integrate immunization registries and WIC database applications to assist WIC providers in acquiring complete/accurate immunization histories and also to provide forecasting on upcoming vaccinations.

VFC Enhancement

In January 2004, a draft document was released by the Centers for Disease Control, in conjunction with the National Immunization Program and the Vaccines for Children Program (VFC), announcing that it would be funding a vaccine management enhancement project. The purpose of this project would be to enhance vaccine management, accountability and efficiency through the automation of VFC vaccine inventory control and reporting. The process would involve working with existing registry applications to institute the functional requirements listed in the table below:

Table 4-9: VFC Enhancement Project Functional Requirements

PROJECT FUNCTIONAL REQUIREMENTS
1. Automate the management of VFC-supplied vaccine inventories by interfacing with VACMAN and its replacement system.
2. Facilitate the introduction of new vaccines or changes in the vaccine schedule.
3. Automate the monitoring of VFC vaccine administration to only VFC-eligible children.
4. Automate the review of provider VFC-eligibility screening procedures and documentation.
5. Produce quality assurance reports (e.g., VFC-eligibility screening, VFC vaccine doses administered, VFC vaccine orders compared to VFC population estimates, etc.).
6. Prevention of unnecessary (duplicative) doses of vaccine.

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PROJECT FUNCTIONAL REQUIREMENTS
7. Create an accurate and complete history for VFC children to assess the extent to which children receive the complete immunization series; assess these completion rates by provider.
8. Provide immunization decision support functions to ensure that immunization needs are accurately assessed and no missed opportunities for immunization occur.
9. Produce routine reports to show coverage rate estimates for VFC children.
10. Automate electronic payment of physician administrative fees.

It is unknown at this point how the final version of the vaccine management enhancement project will differ from the draft that was released in January 2004. Delays and changes have occurred with this project, and at this point, the CDC plans are reported to be tentative. In spite of the uncertainties, current efforts continue through discussions with the Association of Immunization Managers (AIM). These meetings address the AIM member's feedback to CDC that they need more time to assess how the requirements will affect their state immunization programs. Many of the AIM members have responded that their states are already doing a good job with vaccine accountability and fear that changes may damage relationships with private providers.

Tentative plans call for a few pilot states to implement the requirements during the period of May to September of 2005. Full implementation throughout the States would be accomplished over a period of twelve to eighteen months with completion expected around March of 2007.

VFC Enhancement efforts are being initiated to streamline reporting for both providers and state immunization programs. Integration/enhancement of registry applications will lead to cost savings in the form of staff time to record and compile reports, and improve tracking related vaccine inventories and vaccine that has been wasted, spoiled and/or expired for better financial control and accountability.

Integration/Interoperability

A number of national initiatives aimed at data exchange and interoperability (data sharing capabilities) of health information systems have occurred in the last few years. These movements have lead to efforts to integrate numerous related systems including, but not limited to, immunization registries, WIC applications, communicable disease reporting systems, newborn screening databases, electronic medical record/patient management applications, student management software, etc.

The National Health Information Infrastructure (NHII), housed under the US Department of Health and Human Services (DHHS), is responsible for large scale initiatives geared toward integrating health related applications[4]. This national issue has significant funding and policy implications associated with integration of community based electronic health records. Grants

are administered annually by NHII through the Agency for Health Research and Quality (AHRQ) for health information technology and integration/interoperability of electronic medical sources.

Health Insurance Portability and Accountability Act (HIPAA)

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) governs the use and disclosure of "protected health information" (PHI)[5]. It applies to health plans, health care clearinghouses and health care providers who transmit claims information electronically. These entities are considered "covered entities" (CE) under the rule and include virtually all physicians, hospitals and laboratories.

State departments of public health are considered to be "public health authorities". According to HIPAA, CE's may disclose protected health information to public health authorities without consent or authorization as it relates to:

- Reporting as mandated by state/federal law
- Public health activities for which the public health authority is authorized by law to collect, for the prevention and control of disease, to conduct public health surveillance, public health investigations and public health interventions

State immunization registries are technically exempt from HIPAA, though many applications comply with all requirements for security, privacy and confidentiality of data. This often includes the use of authentication, encryption, multi-level password protection and the ability to produce an audit report showing all changes to and recipients of a record.

Though exempt, state laws may be more stringent than HIPAA requirements with regards to consent and data sharing among CE's and public health authorities. Any specific questions or concerns about disclosure to an immunization registry should be addressed directly with legal counsel or other confidentiality expert.

Public Health Information Network (PHIN)

Currently, there are multiple systems in place that support communications for public health labs, the clinical community, and state and local health departments. Each has demonstrated the importance of being able to exchange health information. Many of these systems however operate in isolation, not capitalizing on the potential for cross-fertilization of data exchange. A crosscutting and unifying framework is needed to better monitor these data streams for early detection of public health issues and emergencies. PHIN provides this framework[6].

Through defined data and vocabulary standards and strong collaborative relationships, PHIN will enable consistent exchange of response, health, and disease tracking data between public health partners. Ensuring the security of this information is also critical, as is the ability of the network to work reliably in times of national crisis. PHIN is composed of five key components each with a particular focus described as follows:

- **Detection and Monitoring**
- Focus: Disease and threat surveillance, national health status indicators
- **Data Analysis**
- Focus: Facilitates real-time evaluation of live data feeds, turning data into information for people at all levels of public health.
- **Information Resources and Knowledge Management**
- Focus: Providing intuitive access to reference materials, integrated distance learning content, and decision support
- **Alerting and Communications**
- Focus: Enabling emergency alerting, routine professional discussions, and collaborative activities
- **Response**
- Focus: Management support of recommendations, prophylaxis, vaccination, etc.

PHIN implementation will be accomplished through the implementation of several standards. These standards will focus in the areas of architectural specifications, data models and vocabularies, messaging, a public health directory, and will use standards already developed or under development whenever possible. Representatives from the CDC PHIN project are involved in the other major national standardization/e-Health initiatives to ensure use of industry-wide standards while the needs of public health are addressed. Use of these standards in any systems development or procurement will ensure communication and interoperability within public health and provide the ability to exchange information with external stakeholders using industry standards adopted by PHIN.

Immunization registries will likely be held to a “compatibility” approach for the PHIN certification process. Compatibility is described as: the ability to perform all the required functionality and interact with other PHIN-compatible systems using appropriate technical and data standards; for instance, for exchanging data, using a different data model but mapping the vocabulary into a PHIN standard message structure. This will provide greater latitude for registries and other programs versus the more stringent “compliance” requirement mandating the exact use of PHIN specifications such as the exact logical data model.

Summary of key findings:

To emphasize the findings from the preceding section, “Outcomes of Interviews, Surveys and Documentation Review,” overall, the majority of the stakeholders interviewed/surveyed agreed or strongly agreed that a registry would be beneficial to their program or practice. Computer equipment, internet access, and staff computing skills were determined to be adequate for accommodating a registry if implemented. Current processes are manual and paper-based requiring extensive staff resources for recording, reporting, and tracking. Stakeholders felt that immediate access to patient histories, automated reminder/recall and past due notification,

automated inventory maintenance and accountability, automatic production of school/child care and personal immunization records, and integration with existing patient management systems would be highly beneficial and would improve office flow related to immunization services. Registry implementation would also put Alaska in line with national initiatives such as Healthy People 2010 registry objectives, WIC/Immunization Linkage registry objectives, VFC vaccine management enhancement efforts and general movements toward integration/interoperability among related public health and private healthcare information systems.

4.5 Technical Analysis

With a review of the Alaska geographic and demographic characteristics along with a description of immunization program services conducted throughout the various organizations, Section 3 provides a general understanding of the immunization services delivery environment. Section 4.4 details this environment from the perspective of the providers with a focus on their clinical processes related to the delivery and recording of immunization related activities. Section 4.4 constitutes a discovery of the provider's needs for access to patient immunization information as well as technical solutions the providers require to share their collection of data.

The following sub-section documents the existing electronic systems in place that capture and utilize immunization data. The majority of this review focuses on RPMS from the perspective of both the Alaska Native health corporation and the Alaska Public Health Nursing users. RPMS constitutes the existing statewide immunization registry for Alaska, thus an understanding of the processes surrounding the use of RPMS is critical in determining the feasibility of a true statewide immunization registry system that will meet the needs of all the stakeholders, both public and private.

4.5.1 Process Diagrams

This section describes the flow of patient demographic records and related immunization information within the state-wide Resource and Patient Management System (RPMS). The understanding of these processes is a key element in determining the feasibility of an immunization registry for Alaska since a registry will have to interact with RPMS.

RPMS servers are distributed throughout the state. The user community includes seven hospitals, five physician health centers, twenty-four physician assistant/nurse practitioner health centers, twenty-six State of Alaska Public Health Nurse health centers and 180 Community Health Aide health centers. The distribution of RPMS servers allows each organization to maintain records for their patients locally and prevents other sites from accessing the patient records directly.

Data sharing among the Alaska RPMS user community is accomplished through the Multi-Facility Integration (MFI) system. The individual Alaska Native health corporations can share their data through the MFI or decide not to share their data. Among the IHS nationwide user community, Alaska is the only state to implement the MFI.

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As a module that interacts with RPMS, the MFI creates a master patient index of all patients in the system. It also creates a state-wide database of the encounters from all of the Alaska RPMS sites. The MFI then automatically distributes the demographic and immunization encounters for a patient at one facility to all other facilities that have a record for the same patient.

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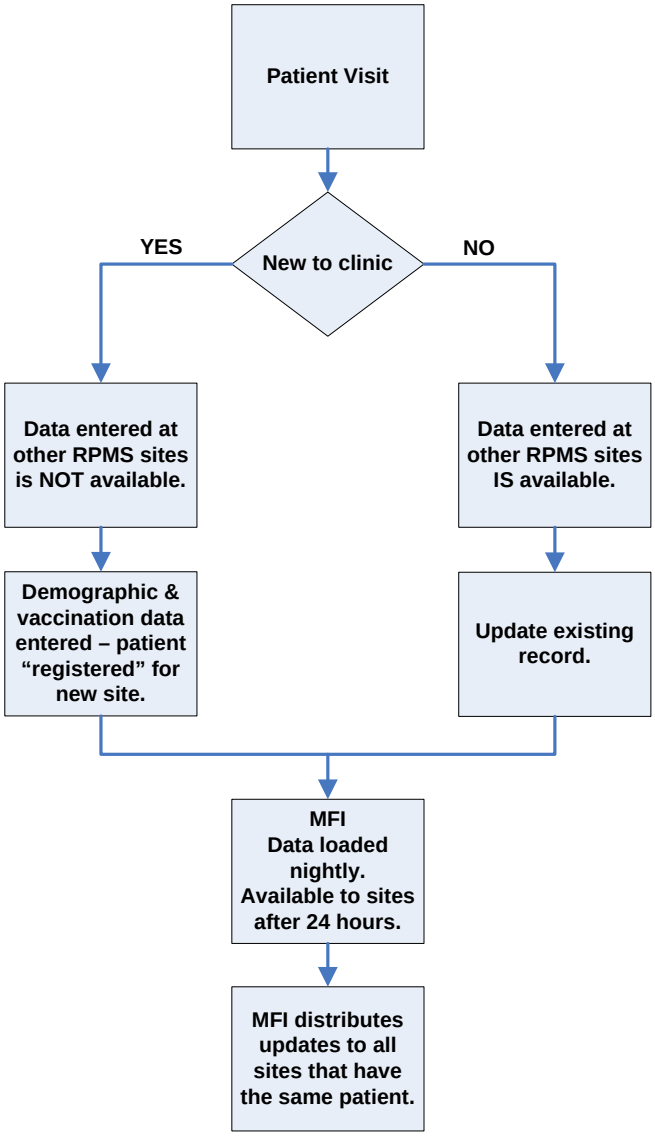
Figure 4-6: RPMS Handing of Patients New to a Clinic.



With the distributed servers and nightly uploads to the MFI, the sharing of a consolidated vaccination record (at least among RPMS users) becomes possible, however access to the record is not immediate for a facility in the case of a first-time visit by a patient. Even though the patient record exists in the MFI, on the first visit to a new facility, the clinician will not have access to the vaccination record. The clinic must first enter the demographic data and the encounter data. The record is uploaded to the MFI that night. With the registration of the patient in the new facility, the full vaccination record will become available to the new facility

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following a twenty-four hour period. On subsequent visits, the new facility has access to the encounters entered by other facilities.

Immunization encounter records are recorded in RPMS through data entry only since there are no batch or real-time processes populating RPMS from external systems. Data entry occurs either at the point of service, Alaska Native Medical Center does this for example, or through delayed data entry from encounter forms. In some cases, Health Aides at village clinics fax or mail encounter forms to the regional facilities for data entry and the Itinerant Nursing visits are followed by data entry upon the return of the nurse to the Public Health Nursing clinic.

The data entry processes are depicted for the Public Health Nursing clinics and the Municipality of Anchorage in the following illustration.

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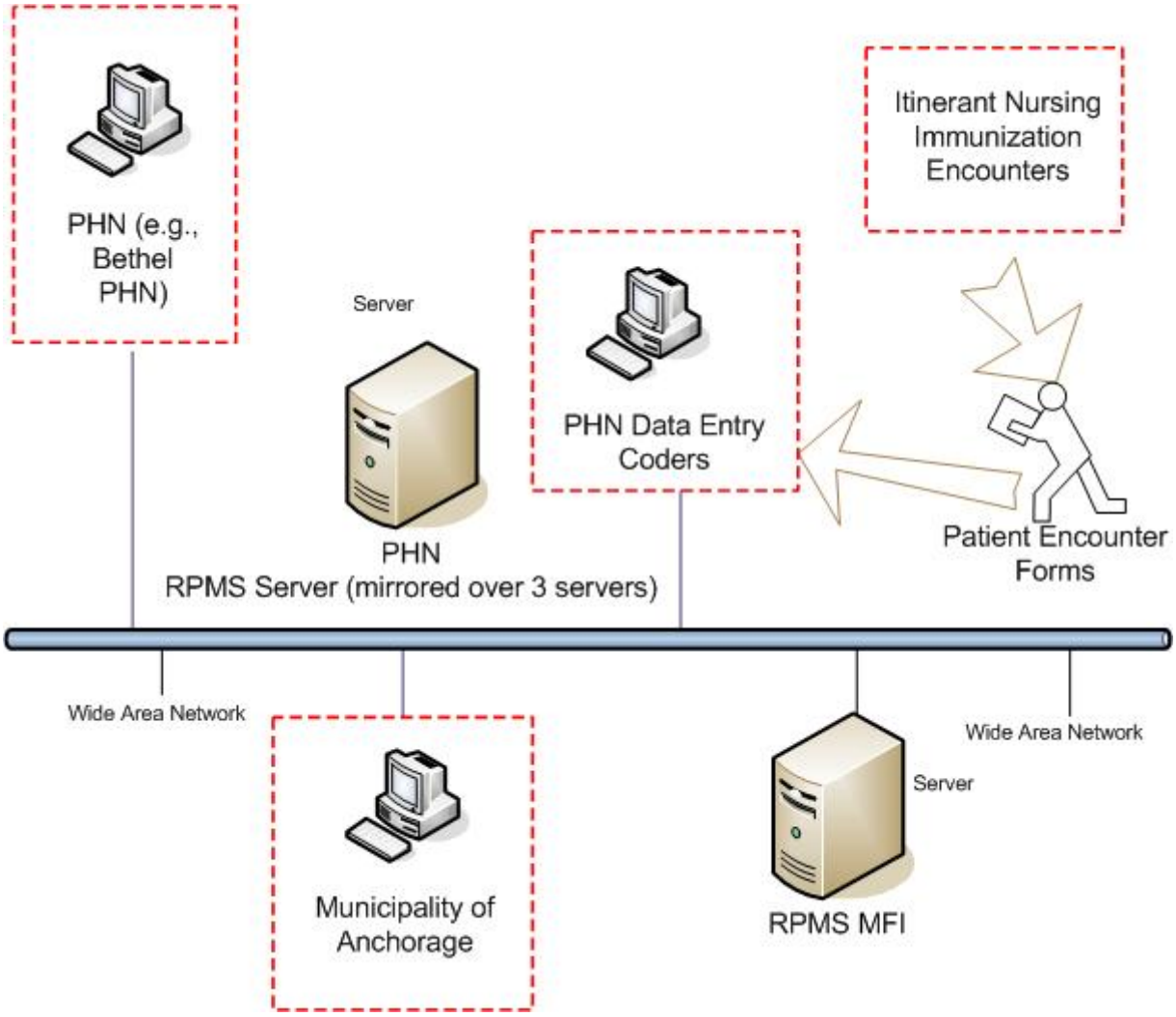
Figure 4-7: Public Health Center and Municipality of Anchorage RPMS Data Entry Processes.



The data entry processes for the clinics and hospitals managed by the Alaska Native health corporations are similar to those of the Public Health centers – that is data entry is either done at the point of service – as ANMC does for example, or the data entry is done based on hard copies of Patient Encounter Forms. These processes are shown on the following illustration.

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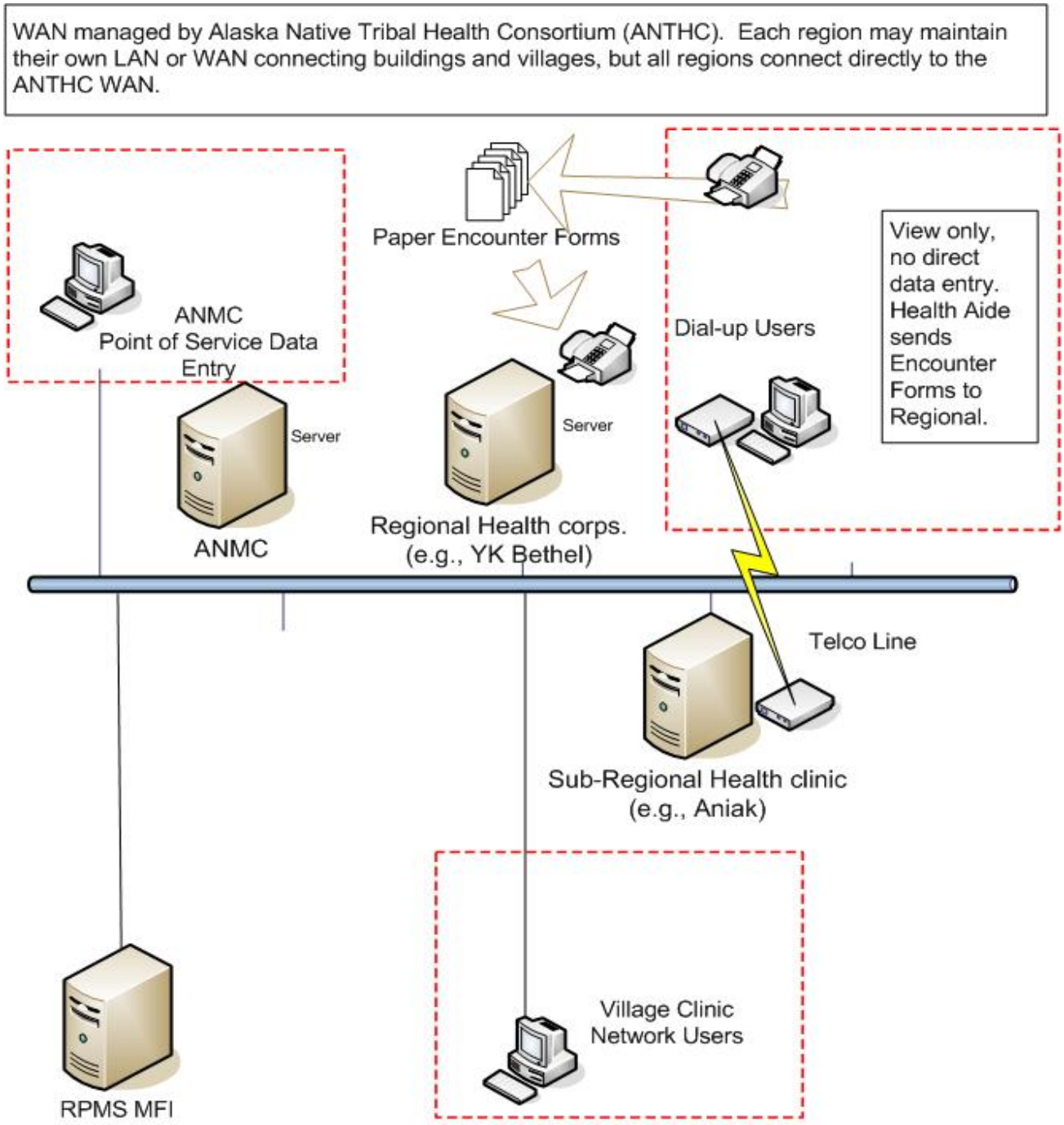
Figure 4-8: RPMS Data Entry Processes Conducted by the Alaska Native Health Corporation Clinics and Alaska Native Medical Center.



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As shown above, the data entry methods range from point of service entry to dial-up, view-only access in combination with submission of Patient Encounter forms requiring data entry to be conducted by organizations external to the vaccinating clinics.

4.5.2 IT Diagrams

At a high level, the RPMS servers run on two different wide area networks (WAN). One WAN is managed by the Alaska Native Tribal Health Consortium (ANTHC) and the other managed by the State of Alaska, Department of Health and Social Services (DHSS). The MFI services the RPMS servers running on either WAN. Associated with the WAN's, local area networks (LANs) connect organizationally associated buildings and local facilities.

Each of the Alaska Native health corporations maintains an RPMS server for its data. The Public Health centers data are handled differently. The data for each of the twenty-six clinics are logically partitioned on a single RPMS server. This server in turn, is mirrored to two other servers in separate physical locations.

The Integration of an Alaska statewide immunization registry with RPMS will need to account for this distribution of RPMS data that will initially populate the registry as well as for updates from the registry to the RPMS data locations. Section 5 of this report addresses the options for integration. The illustration that follows depicts a high-level picture of the separate WANs hosting the RPMS installations.

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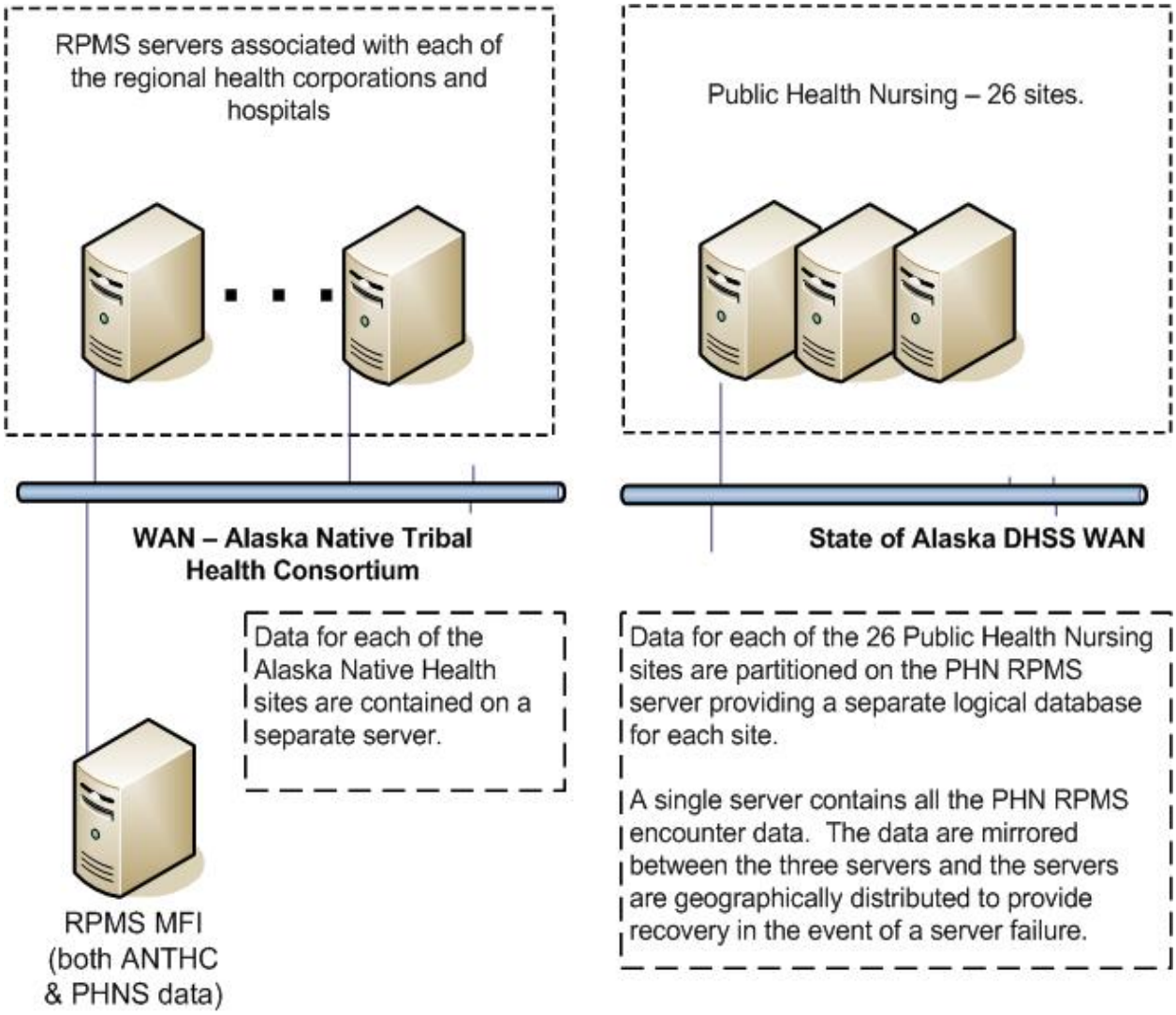
Figure 4-9: Alaska RPMS Network Environment Fix Public Health Centers Take out hocky pucks fix "fault tolerance" Depict the connection to the MFI

Take out the database symbols from in the box "Public Health Nursing - 26 sites"



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4.5.3 RPMS Capabilities as an Immunization Registry – Unmet Needs for a Statewide Immunization Information System

Of the existing systems collecting immunization data in Alaska, RPMS collects and stores the greatest percentage of data. RPMS installations serve the public sector including the Alaska Native health corporations and public health nursing. Due to the large amount of data collected by RPMS and the number of users served, the system and its users will play a key role if a statewide immunization registry is to be implemented. The RPMS provides some, but not all, of the capabilities common to immunization registries, however a number of issues prevent RPMS from fulfilling the role of a Statewide Immunization Information System (SIIS), even for the public sector:

- Access to the patient record, even if it exists in RPMS, is not always immediately available.
- RPMS does not link with Vital Statistics or other key datasets.
- Data entry is sometimes (at times, often) delayed at the point of service.
- No vaccine inventory functionality exists
- RPMS is public health system – the functionality and capabilities are geared towards public health processes. Private providers have different processes and require a system that is designed for those processes.

RPMS does not serve the private sector. Within the private sector, common issues were repeated concerning the delivery of immunizations. The most commonly mentioned issues that the private sector faces in providing immunizations include:

- Recording and reporting processes, such as the state-required “Doses Administered Reports,” are paper-based and time consuming.
- Patient’s families are mobile and much time is spent in tracking down the historical records.

Significant time is spent by school nurses and private provider staff to track down fragmented vaccination records.

Given the assumption that immunization registries are beneficial in the delivery of immunization services to children, the question to be addressed in this section is: “How does RPMS measure up to standards for immunization registries?” This analysis in not meant to determine shortcomings in RPMS but rather to examine the gap between what RPMS provides in comparison to a fully featured immunization registry. The feasibility of registry implementation in Alaska is in part dependent on whether the benefits of a registry are currently being provided by RPMS.

The gap between features provided by RPMS and features provided by an immunization registry meeting the CDC minimal standards, may be examined through a comparison to the Centers for Disease Control National Immunization Program (NIP) Minimum Functional

Standards for Immunization Registries. Documentation for these standards can be found on the CDC NIP Website: http://www.cdc.gov/nip/registry/min-funct-stds2001.htm. In the table that follows, the twelve standards are listed along with a description for each. RPMS is rated for each of the standards to show that it meets, does not meet, or partially meets each standard.

This report recognizes minor differences between the STC gap analysis and findings presented in the "Immunization Registry Support Team Site Visit Report" of July, 2002. The CDC report verified that all twelve of the functional standards were met at the time. Differences that STC found through interviews and system reviews regard the following functional standards:

- Electronically store data on all NVAC-approved core data elements – partially meets.
- Establish a registry record within 6 weeks of birth for each newborn child born in the catchment area – does not meet.
- Enable access to and retrieval of immunization information in the registry at the time of encounter – partially meets.
- Receive and process immunization information within 1 month of vaccine administration – partially meets.

The following table compares the immunization related features of RPMS to the CDC Functional Standards. As an integral part of a statewide immunization information system, it is important that the data required by ASIR meets the CDC Functional Standards and that the data can be shared with the ASIR in a timely manner:

Table 4-10: Comparison the RPMS Immunization Related Features with the CDC National Immunization Program (NIP) Twelve Functional Standards

REGISTRY STANDARD	DETAIL	MEETS STANDARD?			
		YES	NO	PART	
1) Electronically store data on all NVAC-approved core data elements.	These elements are: patient name (first, middle, and last); patient birth date; patient sex; patient birth state/country; mother's name (first, middle, last, and maiden); vaccine type; vaccine manufacturer; vaccination date; and vaccine lot number.			X	

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REGISTRY STANDARD	DETAIL	MEETS STANDARD?			
		YES	NO	PART	
2) Establish a registry record within 6 weeks of birth for each newborn child born in the catchment area.	Identifying information from a population-based data set (e.g., vital statistics) is regularly sent to or retrieved by the registry in a computer file format that requires little, if any, manipulation by registry staff for the data to be entered into the immunization registry. Such information is available in the registry within 6 weeks of birth.		X		
3) Enable access to and retrieval of immunization information in the registry at the time of encounter.	The registry provides a means by which providers can access and retrieve immunization records prior to or at the time of a scheduled encounter.			X	
4) Receive and process immunization information within 1 month of vaccine administration.	The registry receives and processes immunization information within 1 month of vaccine(s) administration (e.g., can include fax or phone requests).			X	
5) Protect the confidentiality of health care information	The registry has written confidentiality policies and procedures in place and implemented, including administrative and technical practices to protect health care information. The policies and procedures are consistent with applicable state and local laws, and Federal law (HIPAA or other privacy law) when implemented, and with the recommended specifications and guidelines outlined in the updated "Community Immunization Registries Manual: Chapter II: Confidentiality," except where they conflict with applicable legislation.	X			

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REGISTRY STANDARD	DETAIL	MEETS STANDARD?			
		YES	NO	PART	
6) Ensure the security of health care information	The registry has written security policies and procedures in place and implemented, including administrative and technical practices and physical safeguards to protect health care information. The policies and procedures are consistent with applicable state and local laws and with Federal law when implemented.	X			
7) Exchange immunization records using Health Level Seven (HL7) standards	The registry has a function, at the central level, that creates, receives, and properly processes the HL7 messages, as specified in NIP's Implementation Guide for Immunization Data Transactions using Version 2.3.1 of the Health Level Seven (HL7) Standard Protocol, June 1999.	X			
8) Automatically determine the routine childhood immunization(s) needed, in compliance with current ACIP recommendations, when an individual presents for a scheduled immunization	The registry has an automated function, accessible at the provider level, that determines needed routine childhood immunizations, in compliance with current ACIP recommendations, given an individual's immunization history to date.	X			
9) Automatically identify individuals due/late for immunization(s) to enable the production of reminder/recall notifications	The registry has an automated function that produces a list of individuals who, as of a given date, are due or late for immunizations according to the registry's algorithm (see Functional Standard #8). The output from this function gives the ability to produce reminder or recall notices.	X			

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REGISTRY STANDARD	DETAIL	MEETS STANDARD?			
		YES	NO	PART	
10) Automatically produce immunization coverage reports by providers, age groups, and geographic areas	The registry has an automated function to assess immunization coverage (e.g., % of children "age-appropriately" immunized) as of a given date for an individual provider's practice, for the registry's entire catchment area, and for subgroups within a practice or the catchment area (e.g., children of a certain age).	X			
11) Produce official immunization records	The registry has an function that allows authorized users to produce an individual's immunization history that is accepted as an official immunization record.	X			
12) Promote accuracy and completeness of registry data.	The registry has developed and implemented a data quality protocol to combine all available information relating to a particular individual into a single, accurate immunization record.	X			

The functional standard analysis of RPMS illustrates that all but four of the CDC standards are met with RPMS. An explanation of why four of the standards are not met is as follows:

- The data elements captured by RPMS closely match those recommended by the CDC NIP. The only one lacking in RPMS is “birth country.” If an immunization registry is implemented in Alaska, the registry will need to meet this standard, as well as the other core data elements. Inclusion of this data element in RPMS would be beneficial if this is the case. In states that have registries, this data is typically populated automatically with vital records-to-registry data sharing.
- There is no automated link between RPMS and Vital Statistics and thus RPMS does not meet the registry standard for the establishment of a record within six weeks of birth.
- The ability to access immunization records at the time of the encounter, or prior to a scheduled visit is partially satisfied. For facilities accessing a patient record previously registered with the facility, the immunization records are available. The patient record is not immediately available, even if it exists in RPMS, if the patient is not registered by the facility attempting to access the record. There is typically a twenty-four hour period between the

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time the patient is registered in RPMS by the new facility and the time the new facility has access to the full immunization record.

- The fourth functional standard, receive and process immunization information within 1 month of vaccine administration, is less of a technical shortcoming than a process issue. RPMS certainly can and does receive immunization information within one month in most cases. The problem discovered through interviews is more related to connectivity issues, staff training and in some cases lack of staff to do the data entry. Situations were found for example, where it is necessary to send paperwork to regional health centers for data entry.

In summary, for the public sector providers, RPMS meets eight of the twelve CDC/NIP functional standards for immunization registries. The most significant shortcomings discovered by the STC analysis are the lack of data sharing with State Vital Statistics and the inability for a clinic to immediately access the complete vaccination record for a patient new to the clinic.

4.6 Needs and Requirements Summary

The following table summarizes comments, issues and concerns as identified from the stakeholder interviews, provider surveys, national analysis and the RPMS gap analysis discussed in the preceding sections. To a great extent, RPMS provides the needs for immunization data collection and reporting in the "public" sector, however the private sector requirements will only be achieved through the implementation of a statewide immunization information system that effectively exchanges data with RPMS.

Table 4-11: Summary of Findings for Immunization Registry Related Needs, Concerns, Requirements and Readiness for Provider Participation

SECTION	SUMMARY OF FINDINGS
Stakeholder Interviews	• Recording and reporting processes are paper based and time consuming • Families are mobile, see multiple providers for services and records are fragmented – time consuming to obtain complete record • Concerns over RPMS data quality, incomplete records and limited access to data • Challenges with confidentiality and data sharing as determined by FERPA and Native health corporations • Computer equipment, internet access and staff computing skills are mostly, but not always adequate • Most commonly stated issues: cost, confidentiality & data sharing issues, staff resources for data entry, potential for integration with existing applications and functionality of a registry application • Majority agree or strongly agree that a registry would be beneficial to the State of Alaska

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SECTION	SUMMARY OF FINDINGS
Provider Survey	• Adequate computers available for patient care • Internet connection speed rated as good or better • Processes for reminder/recall efforts predominately manual and paper based • Highest rated benefits: access to records, reminder/recall, past due notification, automated inventory/accountability, automatic production of immunization records • Highest rated concerns: data entry workload, duplicate data entry, accuracy/reliability of data, system reliability, technical support and staff turnover/training • Most providers willing to spend 1-5 hours/month maintaining records in a registry • Data exports from existing systems would be important • 94% agreed that a registry would be valuable
National Analysis	• Healthy People 2010 – 95% of 0-6 year olds will be entered into a fully operational, population-based immunization registry • WIC screening/referral for 0-2 year olds – directive from USDA • VFC vaccine management enhancement effort, automate vaccine ordering and reporting • Integration/interoperability efforts to link registries with appropriate applications and provider EMR and patient management tools • HIPAA – registries exempt when administered by state/local public health agency • PHIN – defined data and vocabulary standards for exchange of health and disease tracking among public health partners – registries must be PHIN compatible vs. compliant
RPMS Analysis	• Application accessible to only Native health corporation clinics and public health clinics • RPMS compared to CDC/NIP Minimum Functional Standards for Immunization Registries • RPMS does not fully meet 4 of the 12 standards: electronic storage of all NVAC approved core data elements; patient record established in registry within 6 weeks of birth; access and retrieval of immunization info in registry at time of encounter; process immunization info within one month of vaccine administration

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5.0 Recommendations/Conclusions

Based on the information gathered and STC's experience, STC has determined that the State of Alaska Department of Health and Social Services, the Alaska Native health corporations, the private provider community, as well as Alaska citizens can benefit greatly from a statewide immunization registry. It is recommended that while the ASIR should focus on childhood vaccinations, it should also include adult vaccinations.

Much effort, in both the public and private sector, is put forth across the State of Alaska to ensure vaccine is delivered to all residents. The data collected and shared by these efforts are currently recorded and located in multiple systems – both electronic and paper based systems. Alaska lacks a centralized patient immunization record that is accessible by all public and private health care providers, as well as school and child care staff. A statewide immunization registry has the potential to consolidate the fragmented immunization record into complete, easily accessible records for all children and adults receiving immunization services, and can provide a variety of tools to providers for improving the processes and efficiency of immunization services as well as for tracking and accounting for vaccine inventories. Ultimately, a registry could alleviate the current manual processes and lead to extensive time and cost savings.

Immunization registries provide technology that can be shared among other public health initiative programs, potentially saving development costs and time. Because immunization registries are population-based, Web-enabled, secure systems in widespread use among the medical community, they are likely candidates for bioterrorism preparedness and response system integration. Systems that track the demographics and responder readiness for threats such as smallpox or anthrax outbreaks have been developed by a number of states as an add-on module to the immunization registry. At least twelve states have had these systems certified by the CDC to meet the standards required for the smallpox vaccination initiative and transmission of the data to the CDC Pre-Event Vaccination System (PVS). PVS is a national Web-based system developed for the purpose of tracking the responder readiness of each State for an outbreak of Smallpox. States that have developed first responder systems as immunization registry modules benefit through the maintenance of their own data related to bioterrorism preparedness, while at the same time, automatically sharing the data with CDC systems. Some of these same states have also implemented mass vaccination modules as part of their immunization registries. The value of these mass immunization systems has been demonstrated in states such as Louisiana through preparedness drills for a scenario such as a plague outbreak. Other states plan to use mass immunization registry modules for point-of-service data entry during flu vaccination clinics.

The registry functionality that provides the “gold standard” for immunization related data can provide the same standard for BT preparedness and response related data. The single, unduplicated individual record in the registry database can be accessed and updated by

multiple modules, each one with a unique purpose such as for standard immunizations, responder preparedness tracking, or to track mass vaccinations.

The remaining document will detail STC's understanding of the prevalent issues with Alaska's immunization data and provide a conceptual design to resolve these issues. An in-depth discussion of registry "cost versus benefit", critical success factors and primary barriers, along with a suggested implementation plan and associated budget is provided.

5.1 Feasibility of Registry Implementation

There are many facets to implementing an immunization registry including marketing, communication, recruitment and retention of providers. Each of these components serves a vital role in encouraging and enabling stakeholder participation. In order to optimize participation and ensure the success of a registry, an understanding of the immunization registry's value related to each of the stakeholders is imperative, and thus needs to be at the center of the initial effort.

The ability of Alaska's public health community and Native health corporations to share health and immunization information on a significant proportion of the State's residents (65% of the state's 0-6 year old population) through a single system, the Resource and Patient Management System (RPMS), makes Alaska unique relative to other states. This highly populated application, coupled with the fact that Alaska has been aggressively addressing childhood immunization issues for years, has resulted in higher immunization rates when compared to many other states. Furthermore, public health nurses visit remote locations and collaborate with CH/As to ensure that all citizens have access to vaccines and other services.

This framework serves as a foundation to ensure that the recommendations and requirements for a statewide immunization registry will have a high probability of success. A statewide immunization registry would serve as an integrated information resource for all state providers and its stakeholders (i.e., physicians, schools, public health, patients and citizens). Because an investment is required to implement and support such a system, an in-depth understanding of the benefits and value to all stakeholders is necessary.

Through the use of integration technology, the proposed Alaska State Immunization Registry (ASIR) can incorporate all the vaccination records captured in RPMS. It can also include data from private practice patient management systems, billing systems and electronic medical record systems maintained by pediatric and family practice clinics. Other information such as newborn data received directly from hospitals, student vaccination records maintained by school nurses, as well as data entered directly through an Internet browser or sent electronically from Vital Records, Medicaid and WIC can be incorporated. ASIR can become the single source for un-duplicated immunization information available to all public and private stakeholders. This will serve as the "gold standard" for the maintenance of complete, accurate and consolidated immunization records. Once this valuable resource is implemented, the benefits will be

significant for the immunization program and potentially be beneficial for other public health initiatives such as bioterrorism preparedness and response.

Other factors that can contribute to the feasibility of registry implementation in Alaska include the technology improvements and increased market competition in recent years, both leading to lower cost and the availability of robust, mature registry products. Reduced cost, coupled with lessons learned from other statewide registry deployments and Alaska's existing efforts and commitment to the immunization program, has created an environment conducive to the successful implementation of a statewide immunization registry.

STC estimates that the cost to implement such as system will range from $629,250 to $1,850,050 over the first three years of implementation and would include integration, customizations and deployment activities required during that period. On-going support costs beyond the initial three years should be around $120 - 150K per year. An implementation plan should also be developed to target recruitment of the providers representing 80% of the vaccinations given in the state within the first 12-18 months, followed by "low volume" or "last mile" providers and the remaining public health efforts such as integration with other public health datasets (Vital Stats, Medicaid, WIC, communicable disease, etc.).

5.2 Advantages/Disadvantages of Registry Development

The implementation of a statewide immunization registry can be beneficial or not so beneficial depending on the perspective of the stakeholder. The benefits come at a cost and this cost differs for the various groups. Some of the participating organizations are better prepared for registry implementation than others, some organizations may have more to gain than others, and threats to success of the registry can affect all of the stakeholders.

Subsections 5.2.1 and 5.2.2 examine the feasibility of registry implementation through two primary measurements.

- The use of the STC standard for this type of study – the Strengths, Weaknesses, Opportunities and Threats instrument (SWOT).
- A comparison between the estimated implementation costs versus the benefits of a registry

5.2.1 SWOT – Registry versus Status Quo

A SWOT is done for each of the primary stakeholder groups. Each of these groups and the organizations within them are illustrated in the following table.

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Table 5-1: Stakeholder Groups and Organizations

GROUPS	ORGANIZATIONS
Public Health	DHSS Immunization Program, PHN, Vital Statistics, Epidemiology, Municipality of Anchorage and WIC
Alaska Native health corporations	Regional Health corporations, Native Villages, Hospitals, Native Tribal Health Consortium
Private Providers	Pediatricians, Family Practice Physicians, Hospitals
Schools/Child Care	School districts and child care facilities

The following tables provide information on the internal strengths and weaknesses of the registry stakeholders in relation to the opportunities and threats that each may encounter should a registry be implemented. The SWOT analysis will provide the basis for consideration and successful implementation of a statewide registry.

Table 5-2: SWOT Analysis – All Stakeholders

SWOT – ALL STAKEHOLDERS	
STRENGTHS	**WEAKNESSES**
1. Ability to access unduplicated, consolidated immunization histories for all patients in the registry including those utilizing public health, AK Native health corporations, private providers and schools for immunization services 2. Providers have immediate access to immunization history and can quickly/easily generate immunization records for charts, patient use, school or child care 3. Ability to generate reminder/recall for active patients when vaccinations are due or past due 4. Individualized forecasting of doses due based on most current ACIP recommended schedule 5. Decreased opportunity for over immunization 6. Immediate patient recall in situations where a manufacturer recall or temperature incident has occurred	1. No legislation that addresses provider liability relief for registry use 2. Itinerant nursing – no point of service data entry results in lag time for patient updates in RPMS and will result in same problem for the registry 3. Access to a high speed internet connection for a web-based registry application is not available at all sites 4. Provider participation may be optional, so not all patient information will make it to the registry

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SWOT – ALL STAKEHOLDERS	
STRENGTHS	**WEAKNESSES**
7. Ability to conduct internal assessments on immunization coverage levels with minimal effort 8. Ability to automate monthly reporting of doses administered and inventory (with some applications) 9. Patient data is confidential and ownership of record is maintained by most current provider being seen for services 10. Registry security provides audit trail for all individual records	
OPPORTUNITIES	**THREATS**
1. Improved data sharing with public health, AK Native health corporations, private providers, schools and child care centers so all data is consolidated into a single source 2. RPMS contains 65% + of all Alaska children aged 0-6 years and 90% of the Alaska Native population that could be shared with the registry via exports 3. Possibility for automated billing of insurance and Medicaid for administration fees from the registry 4. Consolidation of the public and private provider data will provide public health with abilities to do statewide assessments and identification of “pockets of need” leading to more effective and targeted public health campaigns 5. Ability to utilize the registry in response to disease outbreaks and bioterrorism/emergency events to identify high-risk individuals and contacts.	1. Tribal Health corporations may fail to agree on universal data sharing among the regions and with the registry thereby threatening the ability to achieve a single, consolidated record when services have been received from multiple sources/providers 2. High staff turnover requires frequent retraining of staff 3. Access to application may be inconsistent based on geographical and infrastructure related barriers 4. Technical support for a registry may be limited at public health offices and State IT

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Table 5-3: SWOT Analysis – Public Health

SWOT – PUBLIC HEALTH	
STRENGTHS	**WEAKNESSES**
1. Single source (RPMS) for existing immunization data 2. Strong collaboration with the AK Native health corporations to provide immunization services to native communities	1. Funds associated with the implementation and ongoing support of a registry are yet to be identified 2. Geographic challenges add time and cost to provider recruitment and staff/user training
OPPORTUNITIES	**THREATS**
1. Access to new and/or improved registry functionality such as online inventory management, patient reminder/recall and a variety of new reports 2. Ability to interface with other public health applications, i.e., Vital Statistics, Medicaid, WIC, etc. 3. Use of data by Immunization Program for VFC eligibility determinations.	

Table 5-4: SWOT Analysis – Alaska Native health corporations

SWOT – ALASKA NATIVE HEALTH CORPORATIONS	
STRENGTHS	**WEAKNESSES**
1. Single source (RPMS) for existing immunization data 2. Strong collaboration with public health to provide immunization services to native communities	
OPPORTUNITIES	**THREATS**
1. Access to new and/or improved registry functionality such as online inventory management, patient reminder/recall and a variety of new reports	

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Table 5-5: SWOT Analysis – Private Providers

SWOT – PRIVATE PROVIDERS	
STRENGTHS	**WEAKNESSES**
	1. May require purchase of additional computer equipment designated for patient care 2. May require some data entry effort on the part of the provider 3. In some cases may require duplicate data entry with existing applications
OPPORTUNITIES	**THREATS**
1. Currently provide 45% of all doses administered in the State of Alaska 2. Data exports from existing applications – electronic medical records, patient/practice management system or billing application 3. Significant time savings in record retrieval and consolidation, determining vaccinations due and generation of monthly vaccine reports	1. Development of exports to a registry can be expensive and time consuming to create

Table 5-6: SWOT Analysis – Schools/Child Care

SWOT – SCHOOLS/CHILD CARE	
STRENGTHS	**WEAKNESSES**
1. For schools administering vaccinations – access to forecasting, reminder/recall, revaccination efforts, internal rate assessments, monthly/annual reporting, generation of records	1. May require purchase of computer equipment 2. May require some data entry effort on the part of school/child care personnel 3. May require duplicate data entry with existing AS400 application or other tracking programs
OPPORTUNITIES	**THREATS**

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SWOT – SCHOOLS/CHILD CARE	
STRENGTHS	**WEAKNESSES**
1. Data export from existing AS400 application into registry 2. Significant time savings in record retrieval and consolidation, determining schedule of vaccinations due and generation of monthly/annual school immunization compliance reports	1. Development of export to a registry can be expensive and time consuming to create

Table 5-7: SWOT Analysis – Patients/Alaska Citizens

SWOT – PATIENTS/ALASKA CITIZENS	
STRENGTHS	**WEAKNESSES**
1. Providers have immediate access to immunization history and can quickly generate personal copies 2. Application is confidential and records are available only to those with approved access	1. Providers may charge fee to produce personalized immunization records
Opportunities	**Threats**
1. May receive reminders/recall notices when vaccinations are due or past due.	

A responsible statewide immunization project will focus on achieving the benefits, overcoming the weaknesses, minimizing the threats, and seizing the opportunities within each stakeholder group. The recommendation for Alaska to pursue a statewide immunization registry initiative was determined by recognizing that the benefits and opportunities are readily achievable in a reasonable time period, while the weaknesses and threats do not create “show stoppers” for a successful deployment.

5.2.2 Cost versus Benefit Analysis

Registry Implementation Costs

A full-scale, statewide registry implementation is estimated to take approximately three years. The costs to acquire, customize and deploy an immunization registry system are projected to be in the range of $629,250 - $1,850,050. These costs should include primary tasks such as:

- Modifications to meet the needs of the state, the cost of which depends on the gap analysis between what the solution provides "off-the-shelf" and the state's mandatory requirements. (Note: Registry solutions have evolved in concert with many states' implementations thus now limiting the need for extensive modifications in some cases.)
- Integration with RPMS, Vital Statistics, VACMAN, and possibly other selected program areas. The cost of integration tasks vary depending on the selected solution for the RPMS integration (please refer to Section 5) as well as Alaska's requirement as to how many integration efforts are needed for full implementation.
- The creation and implementation of recruitment, training, support and marketing plans. The cost of these tasks depends on what internal capabilities and resources are available inside DHSS versus having the vendor provide these services during the first three years. (Note: Some states have effective provider communication capabilities already established in the absence of a statewide registry. Based on the surveys and interviews conducted during this assessment with providers, it appears that providers have an overwhelming willingness to participate, potentially limiting the amount of resources required to perform these tasks.)
- Piloting in the public and private sectors, integration of additional public health data sets and statewide deployment costs will vary depending on the number of pilot sites. STC recommends that the number of pilot sites should be in the range of 4-7 public health sites and an equal number of private provider sites.

Clearly, the wide variation within the cost range is due to a number of factors as described above. Another factor that impacts the cost is the type of solution selected by the state. Alaska can choose to either acquire a product from a vendor and incur the associated licensing fees, or adopt a public domain system (i.e., Wisconsin, Michigan, et al.) that are typically void of licensing fees. It is important to keep in mind however, that even with public domain software, outside vendors are typically contracted to implement, customize, deploy and support these systems – sometimes at a cost greater than that associated with purchasing licensed immunization program products. Again, these cost variables are determined largely by the selected software solution (licensed or public domain) to meet the mandatory requirements of the state.

Other Costs

Costs, beyond those assigned for the vendor supplied software and labor, can vary depending on existing resources, salaries and benefits for the State FTE positions and other factors. One such factor will be the degree of participation from the Alaska Native health corporation personnel for tasks such as software training for the Health Aides. It is anticipated that RPMS users will have limited needs to interact with the registry, but some training will be needed to take advantage of reports and other features of the registry. It is recommended that registry training coincide with RPMS training sessions.

Assuming that DHSS engages in a maintenance agreement with the registry vendor for level two and level three support (issues of a more complex nature) an internal help desk will also be necessary for level one (issues of a less complex nature) support. The costs for on-going

training, marketing and provider recruitment need to be defined in terms of full-time equivalent roles. Other costs include hardware, third-party software such as Oracle or SQL Server licenses, and IT support for the database, operating systems and hardware maintenance.

One of the key requirements for a successful registry in Alaska will be integration with provider billing, patient management and electronic medical record systems. It was clear from the interviews with public and private providers, that point of service data entry to a registry user interface will be the exception rather than the rule. Providers were not receptive to conducting duplicate data entry or using the registry interface to perform data entry of immunization information, but would continue to use their existing systems, which in turn would interface and transmit data with the registry. Linkages between the provider systems and a registry will require development of data exports or real-time exchange routines to be established by vendors of the individual provider systems. Coordination by the registry contractor will also be required to facilitate the development and testing of exports with the vendors. In other states that have engaged in provider system-registry linking, providers have shared associated costs with the state to some degree; however, the most successful approaches have resulted from state public health funding the major portion of the cost. Successful provider recruitment and retention hinges on ensuring that providers can achieve maximum benefit with minimal effort.

The estimate for total registry related costs over three years are provided as a range. On the low end, the estimate is $629,250 while the high end cost is estimated at $1,850,050.

Table 5.8 details the estimated costs based on related tasks and assumed FTE salaries and benefits. Note: STC does not have actual data for the salaries included in the FTE estimates. These costs will need to be adjusted for a more accurate estimate.

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Table 5-8: Registry Product Acquisition, Customization, Deployment, Operational, Marketing, Training, Hardware, Travel and Support Costs for Three Years

ESTIMATED REGISTRY COSTS – THREE YEARS			
Cost Component	**Low Cost Estimate**	**High Cost Estimate**	**Comments**
Registry product and related services	$375,000	$1,333,000	Software, integrations, marketing & training plans & implementation, customizations & deployment activities. Cost varies by options taken (open-source, common off the shelf) level of customizations, assistance with training, marketing, etc.
OTHER REGISTRY COSTS			
Immunization Registry Coordination	$120,000	$195,000	1 FTE, 3 years. Low/high salary estimates. Provider and public liaison, responds to level 1 support issues received from Juneau IT Help Desk. Utilizes registry tools for statewide assessments and reports.
Immunization Program management	$56,250	$71,250	¼ FTE, 3 years. Low/high salary estimates. Oversight & supervision.
Ongoing Training	$20,000	$65,000	¼ FTE, 2 years. Low/high salary estimates. Beginning year 2. Level of effort can vary depending on distribution of training efforts.
Ongoing Provider Recruitment & Marketing	$40,000	$65,000	½ FTE, 2 years, beginning year 2. Low/high salary estimates.
OTHER REGISTRY COSTS			
Marketing materials and media	$0	$25,000	Pamphlets, brochures, announcements, etc.
In-state travel	$18,000	$25,000	Greater emphasis on “train-the-trainer” can reduce travel.
Hardware	$0	$40,000	Use existing hardware or purchase new. Includes servers for production & test.
Third party database licenses & support	$0	$20,000	Utilize existing DB licenses or purchase.
IT support - database, hardware and operating system maintenance	$0	$10,800	¼ FTE. Assumption that this will be provided by IT Network and Application services. Ranges from no direct charge to $300/month avg. cost.
Total	$629,250	$1,850,050	Total estimated costs.

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Benefits Versus Costs

Significant benefits as well as costs are associated with implementing, operating and sustaining a statewide immunization registry. The question is whether the benefits to Alaska warrant the cost. Some of the benefits can be projected as dollars saved, while other benefits are less tangible.

One of the key characteristics of electronic immunization tracking and reporting in Alaska is the widespread use of RPMS among the public health sector. In many other states multiple integrated public health systems, rather than a single system are common. With records for 65% of the 0 to 6 year old children in RPMS, a system that provides many of the benefits of an immunization registry, the value to be gained from the addition of a registry must be closely examined.

Four primary groups stand to benefit from a statewide registry:

- Providers
- Patients and Alaska Citizens
- Public Health and Alaska Native health corporations
- Schools and Child Care Providers

Provider Benefits

1. **Consolidated vaccination records** – RPMS merges the records for patients seen by Alaska Native health corporations and public health nursing through use of the MFI. Patients seen by the private providers and schools are not updated in RPMS unless the patient visits an RPMS site and the historical vaccinations administered by private providers are added to the record. The registry brings together all of the provider sources into a consolidated "gold standard" record accessible by all providers. The result is greater data quality for both the demographic and the vaccination record.

   In the interviews, providers indicated a high level of interest (average rating of 4.5 on scale of 1 to 5) for immediate access to the complete vaccination history for children. The statewide survey showed a similar result with a rating of 4.7.

2. **Data Integrity** – Data integrity can be maintained by the registry application through de-duplication and record merging logic. Records in questions deemed as possible matches, but not exact matches, would be transmitted to the central database for manual review and interpretation by assigned staff. Records would be "owned" by the provider that entered the patient or the clinic where the most recent vaccination was administered and recorded. This ensures that patient records are manipulated only by the provider where the patient is considered "active". Finally, the registry is

equipped with an extensive security module, which provides an audit trail registry administrators are able to review where a record originated, what changes were made to the record and by which user and their associated clinic.

3. **Automated Reminder/Recall** – Many of the providers interviewed do not have an automated method for reminder/recall but instead rely on a "tickler" system or on appointment cards given to the guardian at each visit. The registry can provide a reminder/recall system that utilizes forecasting based on the ACIP Recommended Immunization Schedule and has the ability to print mailing labels and postcards, as well as send e-mail messages or prepare a file for an auto-dialer system.

   In the interviews, providers indicated a high level of interest (average rating of 4.5 on scale of 1 to 5) for registry reminder/recall features. The statewide survey showed a slightly lower result with a rating of 4.1.

4. **Automated ACIP Forecasting** – In busy clinic environments, valuable time is consumed in obtaining the vaccination history and determining the vaccinations due based on the history, age, vaccine types previously administered and the current immunization schedule. The registry will save time with patient search capabilities and subsequent display of the forecasted vaccinations based on the ACIP schedule.

   In the interviews, providers indicated a moderate level of interest (average rating of 3.3 on scale of 1 to 5) for immediate for registry automated forecasting features. The statewide survey showed a slightly higher result with a rating of 3.8.

5. **Vaccine inventory management** – The registry will allow providers to electronically track vaccine inventory and to compile vaccine orders in a cost effective manner. This can simplify reporting on doses administered, doses remaining and generate reports by lot number in the event of a vaccine lot recall or out-of-range temperature incident. For those providers using billing systems or patient management applications and exporting information to the registry, these capabilities will be available; however, the level of reporting will depend on what fields are being captured and transmitted from the provider application.

   Provider interviews indicated a moderate level of interest (average rating of 3.2 on scale of 1 to 5) for registry vaccine inventory features. The statewide survey showed a high level of interest with a rating of 4.3.

6. **Assessing clinic immunization levels** – Immunization registry systems typically have capabilities to assess coverage levels through the extraction of records, which are imported into the CDC WinCASA application for analysis and report generation. With access to the registry, self-assessment is possible for any clinic.

In both the interviews and the statewide survey, providers indicated a moderately high level of interest (average rating of 3.7 on scale of 1 to 5) for self assessment capabilities.

7. **Automatic production of personal, school and child care immunization records** – Manual production of immunization histories can be a very time consuming task for providers. The interviews and surveys revealed that this is a big issue for the providers in Alaska. Schools and child care in Alaska require proof of immunization history to ensure vaccination compliance prior to attendance. The registry would allow for quick, automated production of these records and eliminate the need for manual recording efforts.

   In the interviews, providers indicated a high level of interest (average rating of 4.2 on scale of 1 to 5) for registry production of school and childcare vaccination records. The statewide survey showed a high level of interest with a rating of 4.5.

8. **Reduce time spent in tracking down vaccination records** – Because records for all public health offices, Alaska Native health corporations and private providers would be consolidated in a single application, the registry can significantly reduce efforts of requesting patient immunization information (sometimes from multiple sources), waiting for receipt of requested records, and interpretation/consolidation of information received. Interviews with providers, especially private providers, revealed time spent tracking and consolidating records to be the most frequently reported issue. The capability to print the official immunization record will also save time and reduce clinic expenses.

Patient/Citizen Benefits

1. **Improved Health Care** – With a consolidated vaccination record, the chances of repeated vaccinations due to a lack of information are reduced, and the likelihood of the patient receiving the full complement of required vaccinations on time is increased (automated reminder/recall contributes to this). Patient's susceptibility to infectious disease is minimized as a result.

2. **Reduction in missed opportunities** – With providers leveraging the use of automated reminder/recall to get patients into the office for vaccinations, patients are more likely to have more contact with their doctors and be evaluated for their overall health. For children, each visit is an opportunity for assessment and identification of possible future health issues. Forecasting features will also ensure that a child is recommended for all vaccinations due at the time of the current visit.

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Public Health Benefits

1. **Vaccine allocation support**—the most recent flu vaccine shortage illustrated that public health officials need to allocate scarce resources based upon knowing what supplies of vaccine are currently available within the state and where the at-risk populations reside. The consolidated registry can be used to determine at-risk patients (based on age and critical indicator flags) and, through provider based on-line inventories, determine current availability as well as projected demand. This information would be valuable to support the request for new quantities and, when a shortage exists, determine a distribution plan that minimizes risk and impact.

2. **Preparedness**—The immunization registry provides the opportunity to integrate with other key public health data sets to improve the state's overall preparedness to both a natural disease occurrence or a bioterrorism event.

   - With a statewide disease reporting system that captures laboratory or provider disease reports (conforming to new CDC Public Health Information Networking-PHIN standards) the immunization registry can be utilized to review vaccination histories for specific cases of vaccine preventable diseases of patients, family members, household contacts and even populations by zip code. If at-risk individuals are found, they can be contacted or their provider can be contacted to ensure that these individuals are given needed immunizations and/or follow up.

   - First responder immunization histories can also be maintained in the system. Non-routine immunizations such as smallpox would be retained along with the more standard vaccines. These first responders would be notified automatically if a vaccination was due. If an event occurred and special vaccinations were required, this information would be available rapidly, minimizing the risk to the responder and to the state for future liability.

   - Immunization registries are ideal resources to leverage in preparedness training and exercises. As an example, childhood immunization and flu vaccination clinics can be used to test preparedness and respond to a simulated outbreak such as plague that would create an immediate demand for services. Field training can be augmented with real services being provided. The added data improves the information available to all providers.

3. **Opportunities to increase immunization rates**—the ability to coordinate all aspects of an immunization program offers the capability to increase overall immunization rates. For individual patients, registries provide a consolidated immunization record, current forecasting for all vaccinations due at time of visit and reminder/recall based on forecasting algorithms – all of which decrease missed

opportunities. On a larger scale, a registry also offers the ability to run internal assessments with minimal effort (clinic, local, state), as well as prepare a variety of reports to help identify pockets of need for targeted marketing and vaccination efforts in areas or populations where rates are low or lagging. Clean, current data and maximized use of registry functionality can contribute to increased immunization rates and thus increased protection from vaccine preventable diseases.

4. **Partnerships**—the registry allows for increased opportunities to build relationships among vaccine providers and other stakeholders. This also increases the state's ability to form necessary coalitions to address other health care issues. Further, by establishing information accountability throughout the health care community for shared records, opportunities to optimize related resources arise for sharing chronic disease information and trauma and injury data.

Economic Benefits

The above benefits can be used to support the value of a single resource of integrated, secure and un-duplicated data. The "hidden value" however, lies in the economic benefits. For example, it is easy to identify a minimum of over two million dollars per year in actual savings by implementing a statewide registry as suggested. For example:

1. **Cost savings for over immunizations**—The CDC states that approximately one in every five children receives at least one unnecessary vaccination because of poor documentation of their immunization history. In Alaska, this means that over 41,000 children ages birth to 18 years of age may receive an extra vaccine they do not need. At an average cost of $17 per dose, based on CDC contract prices, this translates to nearly $700,000 in cost savings. This savings would ultimately be higher as it does not take into account cost savings associated with vaccine administration or an office visit.

   STC recognizes that the CDC statistics do not necessarily represent the actual rate of unnecessary vaccinations in Alaska. Also, a study conducted in 2000 provided evidence of a low rate of over-immunization. The "Yr 2000 ImmAGE Assessments" conducted by college interns in selected provider offices determined that the rate of over-immunization among a sample of 8,348 patients in the 0 to 35 month range, was 0.8%. Most recently however, the interviews (the complete set of interview notes can be reviewed in Appendix 6.3) conducted in conjunction with this report, do support the fact that Alaska families are mobile as is typical in the U.S., immunization records are not always available and over-immunization does occur.

2. **Cost savings for staff to research patient histories in order to provide the correct immunization—**There are significant labor resources allocated to tracking down and consolidating patient immunization records, determining what doses a patient is due for, documenting the information, entering the information into an

information system, and compiling the information for assessments, reports and ordering, and contacting patients who are due, etc. Although these same functions are necessary, the efficiency an integrated electronic data sharing environment offers would maximize labor resources. There is a costs saving, not so much that staff would be reduced, but the time saved could be allocated to other efforts within a clinic. For example, if it was assumed that the 12 Alaska Native health corporations would recognize, in efficiency savings, one (Full-Time Equivalent) FTE per year, it would amount to $480,000 (12 x $40K). This figure is conservative since the efficiency savings in staff time should also include all private physicians, schools and state personnel.

3. **Community cost savings**—this area is more difficult to measure. Overall economic impact can be measured in terms of how slowly or quickly a community or state is to respond should an outbreak occur. The more completely immunized a population is, the less likely it will be that an outbreak will occur and that the outbreak would have a major economic impact on a community. Tools such as a registry could provide immediate feedback on the immunization status in the affected area and expedite response efforts. The more favorable the media is to the public health response, which in part can be supported through the information within a centralized immunization system, the higher the likelihood the area economy will not be affected. Immunizations or related distributed medicines (antibiotics for example) that are tracked in the registry may not always provide protection from the disease but the ability to assess risks based upon demographics is of value for the response. The economic impact to a community in terms of lost tax revenues, tourism dollars, and increased patient health costs may vary from very little to millions of dollars each year.

4. **Health population economic impact**—Similar to community costs, tracking the economic impact of a healthy population is difficult to quantify. The fact that healthy children will eventually be able to enter the job market and become productive members of a community does however pose real potential for economic benefit. The economic welfare of any community relies on its workforce. Disease that impacts the health of individuals reduces the ability of individuals to contribute. Children that are affected impact their parents and/or guardians in their ability to work. Time off from work is obviously not productive to an economy. Health of individuals and family members is essential. The fact that childhood infectious diseases have, for the most part, been eliminated or significantly reduced means that fully vaccinated children are more likely to grow up healthy and family members will continue to contribute through this period. The Alaska State Immunization Registry, if used proactively, will be a major contributor to the concept of healthy children, healthy families, and a healthy workforce.

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Benefits Summary

The proposed immunization registry will provide both economic and social benefits to the state. The integrated system offers all stakeholders tools and resources that can be leveraged for current immunization efforts to support community growth and overall preparedness when included as one of the cornerstones of a state-based, integrated public health information network. The evolution of shared information to improve overall state public health will be facilitated by the implementation of this system not only in terms of improving electronic data sharing and quality, but improving communications between stakeholders.

5.3 Critical Success Factors and Primary Barriers

The implementation of immunization registries has been ongoing since the mid 1990s. Alaska can benefit significantly from the "Lessons Learned" over the past 10 years from other states that have already implemented statewide registries. There are a number of key lessons that can be applied to Alaska's efforts to ensure successful registry implementation, as well as some issues and barriers unique to Alaska that must be considered. Below is a list of the Lessons Learned that STC believes can positively affect ASIR implementation:

1. Legislation – Though many states operate statewide immunization registries without specific legislation, well crafted legislation can facilitate deployment and maintenance of a registry. Some issues that may be addressed with legislation include existence of the registry, access permissions, release of liability for providers, opt-out vs opt-in (consent) and language for data sharing parameters. Mandatory reporting is not recommended due to its negative perception. Specific patient consent for participation in a registry is also not recommended due to unnecessary barriers that this type of legislative language can create.

Should Alaska decide to forgo prospective registry legislation, the issues listed above can also be addressed through memorandums of understanding included as part of the user agreements for participating providers/users. Patient rights can be addressed through disclosure forms and managed through an opt-out process, acknowledgment or more formal written consent. Compliance would be controlled and monitored under the MOU/User Agreements.

2. Sponsorship – The higher the level of sponsorship support of a state immunization registry, the higher the probability of success. State administered registries have many different levels of support – some states have support at the level of the Governor, while some states have support that begins at the state health department or even programmatic level.

3. Oversight Committee – An oversight or steering committee comprised of key public and private sector stakeholders should also be established. DHSS should maintain the responsibility of the registry; this committee should have some level of oversight to ensure that

all stakeholder requirements are being met. The committee can also aid in overcoming barriers that may arise.

4. Staffing – States need to have dedicated staff to perform administrative, programmatic and help desk support functions for the registry. Throughout the immunization community there are key stakeholders that can be identified to help leverage some of these efforts - whether it is recruitment, training, or general education. Coalitions, professional associations (i.e.: Pediatricians, Family Practice organizations), key users (i.e., Alaska Native health corporations), other public health programs (i.e., VFC, WIC) all can possibly provide some function of support.

5. Formal Support – Having a formal Help Desk, training program, and regular user group meetings all lend credibility and sustainability to the registry. Users will need a reliable resource to attain technical or user support. A training program that can address staff turnover should also be implemented, which may include use of live, online WebEx trainings, other online training options or self-guided training CDs or manuals. Finally, a regular user group meeting schedule should also be implemented where user feedback can be addressed.

6. Implementation Schedule – Deploying a statewide, population based system in both the public and private sector requires a very strategic approach. An implementation plan that builds upon successes using concurrent or parallel efforts versus an implementation plan that produces sequential successes and activities has more probability of being successful and accepted by all providers.

7. Provider Recruitment – Provider participation clearly is the most critical factor to the success of the registry. A statewide deployment needs to have a focused, dedicated effort towards recruitment and retention. The majority of providers utilize billing systems, patient management systems, or electronic medical/health record applications. Interfacing with these systems in a low cost (or at times, no cost) manner and reducing the burden of participation for the provider is a core requirement. Many states for example, are now funding the development of key vendor interfaces to provide incentive for high volume vaccine providers.

8. Parent/Community Education and Coalitions – Parent and community acceptance of the immunization registry is also critical. Any Marketing and Communication Plan must include a Parent Education component. State and local immunization coalitions should play a key role in delivering the correct message to parents as well as the provider community.

9. Integration – Development of electronic data transfers between existing systems to the registry will eliminate concerns about unnecessary duplicate data entry and will link data in related applications as deemed appropriate. In the private physician community, data exports from existing billing systems, patient practice management systems and electronic medical record (EMR) applications will significantly increase the likelihood that large volume immunization providers will participate in sending new and updated data to the registry. Integration with RPMS will also be critical for registry participation from public health and the Alaska Native health corporations. Additional integration efforts should be considered with

related health applications including Vital Statistics, Medicaid, WIC, Communicable Disease Reporting, student management applications (schools/DOE), etc.

Issues/Barriers

Alaska's immunization community is relatively well defined compared to other states, there are still significant issues that will need to be addressed to ensure a successful and sustainable implementation. Listed below are those key issues that have been discovered during this assessment:

1. RPMS – RPMS will be a critical component of the ASIR. Though there is tremendous value in the data that has been collected (and will be collected) there are significant issues that will need to be addressed in terms of data quality, the integration solution with a statewide registry, and the timeliness of data entry. The technical solutions identified to date are able to be addressed and some data processes may need to be modified (timeliness and quality), but the extent that RPMS will be contributing to the ASIR will require some effort and consideration by IHS and the Alaska Native health corporations.

2. Health Corporations – As referenced above, a certain level of cooperation from the Alaska Native health corporations will be required. Key areas will be allowing for the sharing of data with other providers and registry users, and in ensuring data quality. Ensuring that the health corporations are completely engaged and supportive will be critical to the success of a registry effort. Key relationships such as the Alaska Native Tribal Health Consortium can facilitate this.

3. "Remoteness" Impact – Though the State of Alaska has implemented many successful programs in delivering statewide health services throughout the years, the general remoteness of Alaska will have an impact in deploying any type of statewide public health information system. Even with the proposed system being centrally located, supported, and maintained, delivering reliable support (i.e., training, technical support, etc.) and ensuring timely communications between ASIR administrators and users will require the utilization of, or in some cases, possible enhancement of, existing communication technologies. Leveraging these existing communications will be critical.

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6.0 Registry Implementation Plan

Sections 4 and 5 acknowledged the challenges and detailed the costs versus the benefits to be gained through the implementation of an Alaska statewide immunization registry (ASIR). The purpose of this section is to propose a plan for implementation. The plan includes key features for the registry, projected staffing needs, general timelines and phases for implementation. Section 6 concludes with technical recommendations for the for the RPMS-ASIR integration.

6.1 Recommended Registry Key Features

There are eight (8) Key Features detailed below.

(1) Automated Data Exchange Capabilities

There are two primary areas of concern for ASIR's data exchange capabilities: One area of concern is the RPMS data ("public sector") and the other area is the multiple private provider sector data stores ("private sector"). Both sectors need to be addressed. Within Alaska (and this is not unlike any other state) there exists a significant crossover of patients between the public and private sectors – data from both systems need to populate ASIR to consolidate the patient vaccination records. Based on the feedback of users, this exchange needs to occur in the most seamless, non-intrusive manner possible, i.e. through automated, electronic data exchanges.

It's critical that the plan account for a major characteristic of the immunization data environment in Alaska – RPMS usage. Both the Alaska Native health corporation sites and the Public Health Nursing sites will continue to utilize RPMS, not the ASIR user interface, as their primary data entry application for immunizations. They can optionally utilize ASIR for features such as reports, reminder/recall and vaccine inventory, but ASIR must provide vaccination data to the RPMS systems that ASIR knows about and conversely, RPMS will need to send it's data to ASIR. The need to maintain an existing public health system that shares data with the statewide registry is not unique to Alaska. The state of Idaho is similar in this regard. The users in each of the seven health districts in Idaho continue to use their integrated public health systems rather than the statewide registry for data entry since these systems are also their primary data entry application. This has been successful because electronic data exchanges from those systems to the registry have been implemented. At the same time, the users take advantage of the features provided by the registry that are not part of their integrated public health systems.

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For the non-RPMS providers, the expectation is that the majority will opt for the development of data exchanges between their billing, patient management and electronic health record systems. However, based on the surveys and interviews with the providers, it is evident that some are willing to devote staff hours to updating the ASIR with their patient information. This is not unlike other states that have implemented registries. STC has found that there are providers in every state STC has worked in that are willing to conduct data entry in both a billing system as well as the registry. This decision on the provider's part is usually made during the recruitment and registry education phase. Providers sometimes find that the time required for registry data entry tasks is offset by the benefits they realize from access to the registry. These benefits coupled with costs that vendors may charge in conjunction with data exchange development, result in a percentage of providers who interact directly with the registry for all the immunization related transactions. Other providers, especially the higher volume sites and those sites using electronic medical record systems, will expect registry capabilities that include a variety of automated data exchange capabilities relieving the providers from any registry data entry tasks.

For Alaska, the ASIR must provide data exchange functionality to include:

1. HL7 interfaces that conform to the CDC "Implementation Guide for Immunization Data Transactions using Version 2.3.1 of the Health Level 7 (HL7) Standard Protocol." The registry must be able to accept data from external systems as well as provide data to external systems in the HL7 protocol. The capabilities need to accommodate both batch and real-time transmissions in either a unidirectional or bidirectional mode.

2. Optional data exchange functionality to accept batch data loads in non-HL7 formats will be necessary. Many billing systems in use by providers do not have HL7 capabilities native to the application. In some cases, the vendor may not be willing or able to develop the capability, or the cost to do so may be prohibitive. In these situations, the development of a simple batch text file, export routine from the billing system in comma separated format or other delimited format is a viable alternative. STC has found that this is a necessary option and is most successful where the effort on the part of the system vendors is very low. To keep the vendor effort low, the registry product suite will ideally provide a "data mapping" module that accepts text files from the billing systems and transforms the data to a format acceptable to the data structures of the registry. The specifications given to the billing system vendors are kept as simple as possible and the cost kept to a minimum.

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(2) Record Matching (De-duplication) Services

The flow of data from multiple external systems such as RPMS and billing systems to the registry introduces data quality issues that must be resolved. De-duplication services are critical for the successful consolidation of a patient's demographic and vaccination record when submitted from multiple sources.

As in all states, the data received at the central registry will come from many sources, RPMS sites, vital records and other providers. The record for a single child may be submitted from multiple providers at different times. Each submission for the same child may include differences in address and name data elements. Name changes are a particular problem in Alaska, twins need to recognized and kept separate for example. The ASIR will provide the "gold standard" demographic record for immunization related data as well as (potentially) bioterrorism preparedness and response data, thus the de-duplication services are critical. The de-duplication module should include:

1. Blocking of duplications at the point of data entry.

2. Automated de-duplication of incoming batch records and storage for possible matches that require human review.

3. A user friendly interface for manual de-duplication. This should provide information to the registry administrator that allows a quick decision on the administrator's part to keep the possible match as separate records or to merge the records.

4. A user friendly interface for un-merging records that are determined to be mistakenly merged.

The performance of the de-duplication algorithm should be documented through the use of the toolkit provided by the CDC National Immunization Program (NIP).

The time required for the registry administrator to conduct manual reviews of records set aside by the automated processes should be minimal. Each manual review decision of potential matches should take no longer than fifteen seconds for an experienced reviewer. It is projected that on a daily basis, the manual review tasks should take approximately fifteen minutes or less. This estimate is based on the time this task is taking in a state (Wyoming) with a population close to that of Alaska.

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(3) Patient Record Ownership and Privacy

A patient record added to the registry or edited by multiple providers introduces a second issue, one related to the ownership of the record and protection of data elements that should be considered private to the facility submitting the data.

The registry must provide a means of defining immunization providers / appropriate users of ASIR and facilities within the organizations. Also, access levels should include capabilities restricting users to view-only or for editing abilities as appropriate. Patient privacy features should include the separation of "private" and "public" data. In other words the "owner" of the patient record needs to have access to the address information and (other sensitive data elements) that the owner has entered but at the same time these data elements should not be accessible to others. Public data on the other hand, such as name, date of birth and the vaccination history, needs to be available to all users, statewide. Additionally, administered vaccinations recorded by providers should not be editable by a site that did not administer the vaccination.

(4) Vaccination Forecasting Services

With the capability to receive data from multiple sources and maintain the quality of the demographic and immunization records, the registry must be able to utilize the data in a number of ways that benefit the users. One of these features is vaccination forecasting.

In states that have successfully implemented immunization registries, it has been demonstrated that many nursing staff rely on the registry's forecasting algorithm to evaluate the patient's age, vaccination history, and possible contraindications to quickly determine the vaccinations due. This is especially true in high volume sites where the time saved in making the individual decisions becomes significant. The usage of this tool directly impacts the effectiveness in recruiting providers as well as satisfies the CDC's NVAC guidelines.

The registry forecasting feature must be accurate and must be maintained by the product vendor to keep up with ACIP changes and with the addition of new vaccines.

(5) Reminder/Recall Services

Utilizing the vaccination forecasting algorithm, this feature should include the capability to provide reminders or recall (past due notifications) through various methods to include:

- Mailing labels
- Postcards
- E-mail notifications
- Auto-dialer files

Reminder/recall notices should allow the selection of a single vaccine or lot number, or selected lists of vaccines and lot numbers. The usage of this tool directly impacts the effectiveness in recruiting providers as well as satisfies the CDC's NVAC guidelines.

(6) Reports

Some electronic systems that require input from users, unfortunately fail to provide a means for the users to query the data, sort the data, and print reports using varied criteria. Systems without reporting capabilities for the end users are rarely successful. Registries generally provide numerous reports, many that are especially useful to providers who may have no means of tracking immunization information or limited means through a billing system. This includes reports mandated by the state such as doses administered. Other specific reports should include vaccination records for patients, school certificates, deferred vaccinations for high risk patients, etc.

Reporting features should include patient listings, coverage by age and immunization series and vaccine accountability to name a few. It is important that all the reports allow ad hoc capability and reduce the need for many different, specialized reports.

(7) Assessments

Coverage reports may be sufficient for the needs of many clinics to determine how well their patient population is immunized; however, some organizations benefit from the added information that can be generated through other assessment tools.

A significant number of respondents to the surveys and responses in the interviews suggested that providers would benefit from the ability to conduct self-assessments of their patient populations for immunization coverage levels. The registry should provide a means to export the data specific to the facility's patient population in a file format compatible with assessment applications such as the CDC's WinCASA application.

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(8) Vaccine Inventory

Self-assessment capabilities are one means of utilizing the data collected by the registry. This capability provides value to providers with minimal effort on their part, particularly if the data exchange between the provider's patient management system or other clinic system is automated. Other features, such as vaccine inventory management, do require a level of effort for providers to maintain; however, the benefits to be gained through the use of an on-line inventory system often outweigh the effort involved.

The interview and survey results revealed that providers rated the ability to track vaccine lots and usage as moderately beneficial. The registry should include the capability to maintain an inventory of vaccine lots received and automatically decrement the doses remaining as administered vaccines are recorded. It should also provide the means to adjust the inventory for wastage, spoilage, expired lots, transferred vaccine, and compromised vaccine. Reports should be available that track doses received, doses used, and doses remaining.

Those providers who may be using the ASIR to conduct data entry can realize significant benefits from maintaining the vaccine inventory on-line. It not only gives them a means of tracking and reporting inventory levels on-line, it can also significantly reduce the data entry time for administered vaccinations and increases the accuracy of the vaccination record. At the point of entering the vaccinations for a patient, a few mouse clicks can select the correct lot, enter the vaccine type, and save multiple vaccines administered in a single step.

Summary of Key Features

The eight features listed are recommended as mandatory requirements for the ASIR if it is to be implemented; however, the acceptance of a registry by the user community hinges on other characteristics as well. One of the most important is "ease of use" and "low training requirements." Any registry system that may be implemented in Alaska must be a mature product with an established user base in other states where the users have had ample opportunities to direct the evolution of the product. The State of Alaska, DHSS, and the registry user community stand to benefit from the years of user experience and the fine tuning of products and processes conducted by numerous state immunization programs.

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6.2 Key Processes

There are many facets to implementing an immunization registry including marketing, communication, and recruitment/retention of providers. Each of these components provides a key ingredient to enable participation, and success for a registry relies on participation. To optimize participation, an understanding of the immunization registry's value for each of the stakeholders is paramount, and thus needs to be at the nucleus of the initial effort. Key to attaining the value will be integrating datasets and ensuring the quality of this data.

An immunization registry solution must include data from many sources and provide automated processes to share this data (bi-directionally in some cases) between the registry and the source systems. The following table details the data source, data description, and the type of connectivity required to share data with the registry:

Table 6-1: External Sources of Data for the ASIR

DATA SOURCE	DATA DESCRIPTION	CONNECTIVITY (HOW DATA WILL BE ENTERED/SHARED)
Health Corporation and Public Health Nursing	RPMS – Resource and Patient Management System – collect administered and historical vaccinations, demographics, lot number. Primary data entry application for Health Corp (exception: Norton Sound) and Public Health Nursing	Two way, real time integration.
Private Provider Billing PMS, and EMR systems	Primary data entry for private sector. Demographics and immunization data (CPT codes).	Primarily data will be one way batch file – high volume providers with EHR/EMRs may want two way connectivity.
Vital Statistics	Birth and Death data. Demographics, initial HepB vaccination at birth. Adoption notification. Deceased notification.	One way batch file – ASIR will handle adoption and death situations appropriately (as determined by DHSS).
Medicaid	Demographics and immunization encounter data (CPT codes).	One way batch file.
Military Bases	Demographic and immunization information	Manual access to web application
Schools	Demographic and historical vaccinations	Manual access to web application
Permanent Fund	Demographics. Outdated address information decrease the registry quality. The permanent fund data can drastically	One way batch file.

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DATA SOURCE	DATA DESCRIPTION	CONNECTIVITY (HOW DATA WILL BE ENTERED/SHARED)
	improve data quality.	
Municipality of Anchorage	Primary data entry application for the city clinics. Similar to RPMS in the level of integration.	Two-way, real-time integration.
Other State Registries	Demographic and immunization information	Query only. Some download functionality.

6.3 Projected Staffing Needs/Staffing Patterns

The Cost Versus Benefits Analysis, section 5.2.2 provides cost estimates that include the recommended immunization program staff FTE's to support the on-going operations of ASIR. The purpose of this section is to further define the roles and responsibilities of those positions and to provide justification for the staffing patterns based on actual registry operations in other states of similar population with similar registry needs.

In many states that operate immunization registries, single staff members fulfill multiple roles. Responsibilities for the title "Registry Coordinator" for example, may include duties as varied as training, support, provider recruitment, and enrollment. At least two other states where STC has experience, Idaho and Wyoming, are similar to Alaska in terms of population and registry requirements. The registry related FTE utilization ranges from 2.5 to 3 FTE's in these states and the staff filling these roles find that they need to be flexible and be willing to wear several hats.

Table 6-2: Recommended Roles and Responsibilities for registry operations

ROLE	RESPONSIBILITIES	ASSIGNEE		
		IMMZ PROG	STATE ITS	PRODUCT VENDOR
Immunization Program Manager	• Supervises immunization program staff, primary liaison to CDC, AIM, AIRA, NVAC, coalitions, the public and medical associations. • Responsible for budget and ongoing sustaining funds.	X		
Registry Coordinator (or Manager)	• Conducts/coordinates user group meetings, gathers user requirements for modifications. • Liaison to the registry product vendor	X		

ROLE	RESPONSIBILITIES	ASSIGNEE		
		IMMZ PROG	STATE ITS	PRODUCT VENDOR
	& State ITS staff. • Conducts user acceptance testing for new releases & patches. • Has overall responsibility for training, marketing, recruitment and local help desk. • Responds to requests for information from providers and the public. • Monitors data quality & utilizes registry utilities to conduct manual de-duplication tasks, investigates and resolves user reports of duplicate records. • Maintains user accounts. • On-site expert for registry system functionality and related processes.			
Training Specialist	• Conducts or coordinates application training for all public and private providers. • Utilizes various methods for training such as group demonstrations & practice, on-line training sessions, dissemination of user guides & quick references. • May train users directly or through a "train-the-trainer" approach.	X		X
Marketing/recruitment Coordinator	• Educates provider community through presentations, demonstrations and distribution of brochures & handouts. • May design and create marketing materials. • Distributes enrollment packets & policies to providers. • Maintains database of providers, enrollment status & types of billing systems in use. • Acts as liaison between providers, billing system vendors & registry product vendor in the development of data sharing processes.	X		X
Help Desk(s)	• The State ITS Help Desk staff is the first point of contact for registry users. The ITS Help Desk logs and tracks all	X	X	X

ROLE	RESPONSIBILITIES	ASSIGNEE		
		IMMZ PROG	STATE ITS	PRODUCT VENDOR
	issues, determines whether the issues are related to network, hardware, operating system, etc., and resolves these. • Other support issues are passed on to the local (immunization program Help Desk) for resolution. • Issues that the ASIR support staff is not able to resolve (level 3 issues) are escalated to the registry application vendor.			
Database Administration	• Database backup & disaster recovery. • Performance monitoring & tuning. • Installation of the database schema, performs database upgrades and patches.		X	X
Web Application Administration	• Application installation. • Applies upgrades and patches.		X	X
Network & Hardware Support	• Installs and monitors server hardware software. • Monitors server operating systems, applies patches and upgrades. • Ensures WAN and Internet connectivity. • Cooperates with the ITS Help Desk in troubleshooting & resolving IT support issues.		X	

As noted in the table, certain roles such as training may be disbursed to organizations outside of the immunization program as well. Training tasks are particularly appropriate to distribute for a number of reasons. Due to the remoteness of sites and the cost and the time necessary for travel, STC recommends that the immunization program consider a "train-the-trainer" approach and establish a training team among those who conduct RPMS training and perhaps within the itinerant nursing services staff. The objective is to leverage the time and cost of staff who normally travel to remote areas as part of their current activities. A similar approach has proven successful with both the state of Idaho's immunization program, IRIS and the state of Louisiana's immunization program, LINKS. In Idaho, the state registry coordinator trains the staff within the seven regional health districts and the health district staff trains the private providers within their districts. This approach is beneficial in a number of ways. Not only does it reduce travel expenses, it also keeps the local health department personnel in closer touch with the providers in their districts and affords additional opportunities for provider vaccine education,

follow-up on vaccine accountability issues, and feedback from providers on their success (or need for changes) in the use of the immunization registry system.

The table also illustrates how the responsibilities for the roles may be distributed among different organizations. User support (Help Desk) is one example of a distributed task. Based on the interview conducted with the ITS staff in Juneau, the Help Desk activities would likely be shared among three organizations:

- The Alaska Information Technology Services (ITS) Help Desk in Juneau would be the first point of contact for all user registry user support issues. Certain issues may be appropriate for ITS to attend to and resolve, but the primary tasks for the Help Desk at this level, will be to log user issues, refer the issues to the appropriate staff and continue to track the issue through resolution.
- Issues not related to the state WAN infrastructure, registry servers, hardware, connectivity, etc. are appropriate for the immunization program staff's local Help Desk.
- The local Help Desk may refer issues not resolvable at their level to the vendor of the registry system. These issues are typically categorized as “level 3” issues and may be related to software defects, design issues or application configuration settings.

Section 6.3 of this report projected staffing costs to be roughly equivalent to 2.25 FTE’s of varying job classifications. Within that allocation of staff time, the Registry Coordinator position should be filled by a single person dedicated to this role. The responsibilities that fall within the partial FTE allocations for training, support, marketing and recruiting are typically shared among two or more people, or may be contracted out. The immunization program in Wyoming shares all of the duties except for provider recruitment and provider training, among 2.5 FTE’s. This includes the maintenance of the server hardware, operating systems, database, database upgrades, and application upgrades. All of these positions are contained within the immunization program. Provider recruitment and training is conducted jointly by the state staff and their registry vendor, professional services department.

Staffing patterns necessary for the operation of a registry in Alaska can vary in terms of the number of personnel. Also, while single staff members may perform a wide variety of duties, the total staff time is estimated in the range of 2.25 to 3 FTE’s. For the Alaska DHSS Immunization Program, the total FTE requirement will depend on the degree to which responsibilities for training, support, and recruitment are disbursed to other organizations.

6.4 Projected Costs

Section 6.3 detailed projected costs based on options Alaska may take in procuring software along with implementation services and provided a high-cost/low-cost range. This section supports the projected costs with additional information and gives an example three-year cost allocation plan using the high end of the range.

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The immunization registry market has undergone significant changes over the last several years. Many factors have effectively caused a reduction in the cost of implementing an immunization registry system. The primary factors are listed below:

- Increased technological capacities of state public health agencies which allow for significant technology and resource leveraging
- Mature immunization registry systems / vendors have overcome many technological and support issues
- Increased competitiveness within the remaining statewide immunization registry vendors

These general factors, coupled with specific Alaska efforts create a low cost / high success opportunity in deploying a statewide immunization registry:

- Data collection and data sharing (use of the MFI with Public Health) efforts of RPMS
- The immunization programs efforts of creating, deploying, and maintaining such tools as ImmAGE and SelfImmAGE
- Public Health's commitment to deliver services statewide using itinerant nurses
- Private sector's knowledge of and desire to use an immunization registry
- School nurse collection of historical shots and their desire to utilize an immunization registry

All of these specific Alaska efforts have created an environment that allows for the implementation of a statewide immunization registry project that includes objectives relative to the implementation plan above. It is estimated that the cost to implement such a system would range from $629,250 to $1,850,050 over the first three years of implementation. These costs should include all integration, customizations, and deployment activities required in the first three years. On-going support costs beyond the initial three years should be around $120 - 150K per year. Below is a table that details an example allocation of the funds during the three years of implementation:

Table 6-3: 3 Year Financial Projections – ASIR Vendor Implementation, Software Costs and Vendor Maintenance Costs – Example Allocation

	LABOR	SOFTWARE PRODUCTS	TRAVEL	MAINTENANCE	YEAR TOTAL
Year 1	$350,000	$200,000	$60,000	$0	$610,000
Year 2	$200,000	$200,000	$20,000	$120,000	$540,000
Year 3	$ 50,000	$0	$10,000	$120,000	$180,000
Sub-Totals	$600,000	$400,000	$90,000	$240,000	
Total					**$1,330,000**

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Note: A registry staff of approximately 2.25 to 3 DHSS FTE's will be required to support and administer the ASIR.

6.5 General Timeline/Implementation Phases

There are a number of factors characterizing the state of Alaska that would allow for a relatively quick implementation of a statewide immunization registry:

- The wide use of RPMS in public health
- The cooperative relationships between schools and public health
- The cooperative relationships between the Health Corporations and public health
- The number and density of the "high volume" urban areas to be deployed to (Anchorage, Fairbanks, Juneau)
- Implementation of a new Vital Records system
- Internet connectivity throughout the private sector

Taking all of these into consideration, an implementation plan that would target the providers representing 80% of the vaccinations given in the state could be achieved within 12-18 months. Subsequent phases would target the "low volume" or "last mile" providers. The implementation plan below assumes a three-year effort. Generally speaking, public health deployment will occur in Year One with some deployment to the private sector occurring concurrently; Years Two and Three will focus primarily on the remaining private sector and the remaining public health efforts such as integration with other public health datasets (communicable disease, WIC, etc).

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Table 6-4: ASIR 3 Year Implementation Plan by Year and Phase

YEAR	PHASE/DESCRIPTION	ITEM

1	Phase I – Implementation and integration (2-4 months)	**Planning**
		• AK required customizations
		  • User Interface
		  • State Reports
		  • RPMS / Health Corporations Integration
		• Training plan
		• Support plan
		• Marketing/communication plan
		• Recruitment/retention plan
		Installation of core ASIR application
		Integration of key public health datasets
		1. RPMS
		2. Vital Records – birth
		3. Vital Records – death
		4. Vaccine inventory (VACMAN)

	Phase II – piloting (1-3 months)	**Public health pilots** **Implement support plan** • Help desk • Documentation • ASIR user meetings **Implement training plan** • Train the trainer **Implement marketing/communications Plan** • Presentations to professional associations • State conferences • Newsletters **Implement pilot phase** • Deploy to pilot participants **Additional integration of public health datasets** • Medicaid • Permanent Fund

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YEAR	PHASE/DESCRIPTION	ITEM
		Implement state to state registry communication
	Phase III – Public Health Statewide Deployment; Private Sector Pilots (3-5 months)	**Continued marketing and communication efforts** **Continued ASIR support efforts** **Implement recruitment/retention Plan** • Deploy to "high volume" providers • Deploy to health corporations • Deploy to public health nursing • Deploy to schools **Continued ASIR training efforts**
2 & 3	**Private sector statewide deployment** **Phase IV – "last mile" providers and ongoing support (TBD)**	**Continued recruitment/retention efforts** **Target "low volume" or "last mile" Providers** **Continued marketing/communication Efforts** **Continues ASIR support efforts** **Ongoing ASIR enhancements and maintenance**

6.6 RPMS-ASIR Integration – Recommended Solutions

The feasibility of immunization registry implementation in Alaska has been examined in earlier sections of this document. However, one very positive factor that Alaska has going for it deserves special attention. The advantage is this – in Alaska, the providers administering 55% of the vaccinations are all using the same system to track demographics and immunization encounters – RPMS.

RPMS captures nearly all of the data elements recommended by the National Immunization Program (NIP), it has a process to merge and distribute patient record changes made at one medical organization to the other locations that are tracking the same patient and the system is installed throughout the state, even in the most remote locations. Not all states have had this advantage. It is often the case that the public health sector (Washington and Idaho for example) uses different integrated public health systems from one local health unit to another. A challenge in these states is integration of the registry with multiple public health systems in addition to the private sector systems.

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This section describes two different solutions for RPMS-ASIR integration. The first solution is based on the current state of the Multi-facility Integration (MFI) process while the second solution is base on changes that are planned for the MFI during the coming year.

A follow-up conversation with the Alaska Native Tribal Health Consortium (ANTHC), Director of Information Technology, revealed that plans are in the works to rewrite the MFI during the coming year. The rewrite can accommodate the current shortcomings of the MFI regarding data needed for ASIR integration. The planned rewrite also includes MFI functionality to allow communication with partner systems using the HL7 messaging protocol. These changes to the MFI will provide the framework for the proposed second solution which is the preferred solution.

Other factors that were considered for both of these solutions include:

- RPMS users do not always have immediate access to the complete vaccination record even if it exists in the MFI.
- The MFI does not store the historically entered vaccinations that exist in the RPMS databases.
- Certain other data elements that are captured by the RPMS sites are not exchanged with the MFI. Some of these are of high value to the immunization registry database.
- A critical success factor for the implementation of a registry in Alaska is the exchange of data from RPMS to the ASIR. This will be the primary benefit to private provider clinics and to the schools.
- The greatest benefit of registry implementation in Alaska to the RPMS user community will be the automated population of the RPMS immunization records with updates from the non-RPMS systems.
- A second significant benefit to the RPMS users will be the data exchange capabilities between RPMS and ASIR that will resolve the problem encountered when a child is new to a clinic. At this point, the MFI cannot provide the vaccination record to the RPMS clinic; however, integration with the ASIR will make this possible. The telephone conversation with the ANTHC Director of Information Technology confirmed that this would be highly beneficial to RPMS clinics.
- The MFI does not have HL7 data exchange capabilities. However, the MFI rewrite will include this functionality.

A primary design issue regards the optimal RPMS point of data exchange with the ASIR. Since one purpose of the MFI is to consolidate the records from the individual RPMS sites, it seems to be a logical choice for the data exchange with the registry. In its current state however, the MFI does not provide some of the critical data that will be required by ASIR. The table that follows compares data elements captured by RPMS to those elements that are also transferred to the MFI.

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Table 6-5: RPMS Demographic and Vaccination Related Data Compared to the Transmission and Storage of the Same Elements in the MFI.

DATA ELEMENT	RPMS	MFI
M=Mandatory, O=Optional, N=Not Present, U=Unknown		
Guardian First Name	O	N
Guardian Middle Name	O	N
Guardian Last Name	O	N
Guardian Work Phone Number	O	N
Guardian SSN	O	N
Mother's Maiden Name	O	O
Patient First Name	M	M
Patient Middle Name	O	O
Patient Last Name	M	M
Patient Suffix	O	O
Patient Medical Record Number	M	M
Patient Mailing Address	O	O
Patient Address City	O	O
Patient Physical Address	O	O
Patient Address State	O	O
Patient Address ZIP Code	O	O
Patient Phone Number	O	O
Patient Birth State	O	O
Patient Birth Country	N	N
Patient County Code	O	O
Patient E-mail address	N	N
Patient Ethnicity	O	O
Patient Race	O	O
Patient Gender	M	M
Patient SSN	O	O
Patient Language	N	N
Patient Birth File Number	U	U
Patient DOB	M	M

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DATA ELEMENT	RPMS	MFI
Patient School District	N	N
Patient Inactive Code	M	M
Patient Comments	O	N
CPT Vaccine Code	O	O
CDC Vaccine Code	M	M
Vaccination Anatomical Site Code	O	U
Vaccination Adverse Reaction	O	O
Vaccination Contraindication	O	O
Vaccination Date	M	M
Vaccination Deletion Date	N	N
Vaccine Lot Number	M	M
Vaccine Expiration Date	N	N
Historical Vaccination Flag (or indicator)	Y	N
Vaccine Manufacturer Name	M	M
TB (Test Result) Indurations (mm)	O	O
Vaccination Comments	N	N
Vaccination Facility Identifier	M	M
Vaccination Physician Identifier	M	M
Vaccinator Identifier	M	M
Vaccine is Publicly Supplied Indicator	U	U
VIS Form Given Date	O	O
VIS Form Publication Date(s)	O	O

The table shows that for the demographic related data elements, only five are guaranteed to make it to the MFI. They are:

- First Name
- Last Name
- Medical Record Number (single patient can have multiple MRN's in the MFI)
- Gender
- Date of Birth

To meet the standards of de-duplication processes for the ASIR, the MFI is not an optimal source of data based on the demographic data elements that are captured. Also, historical

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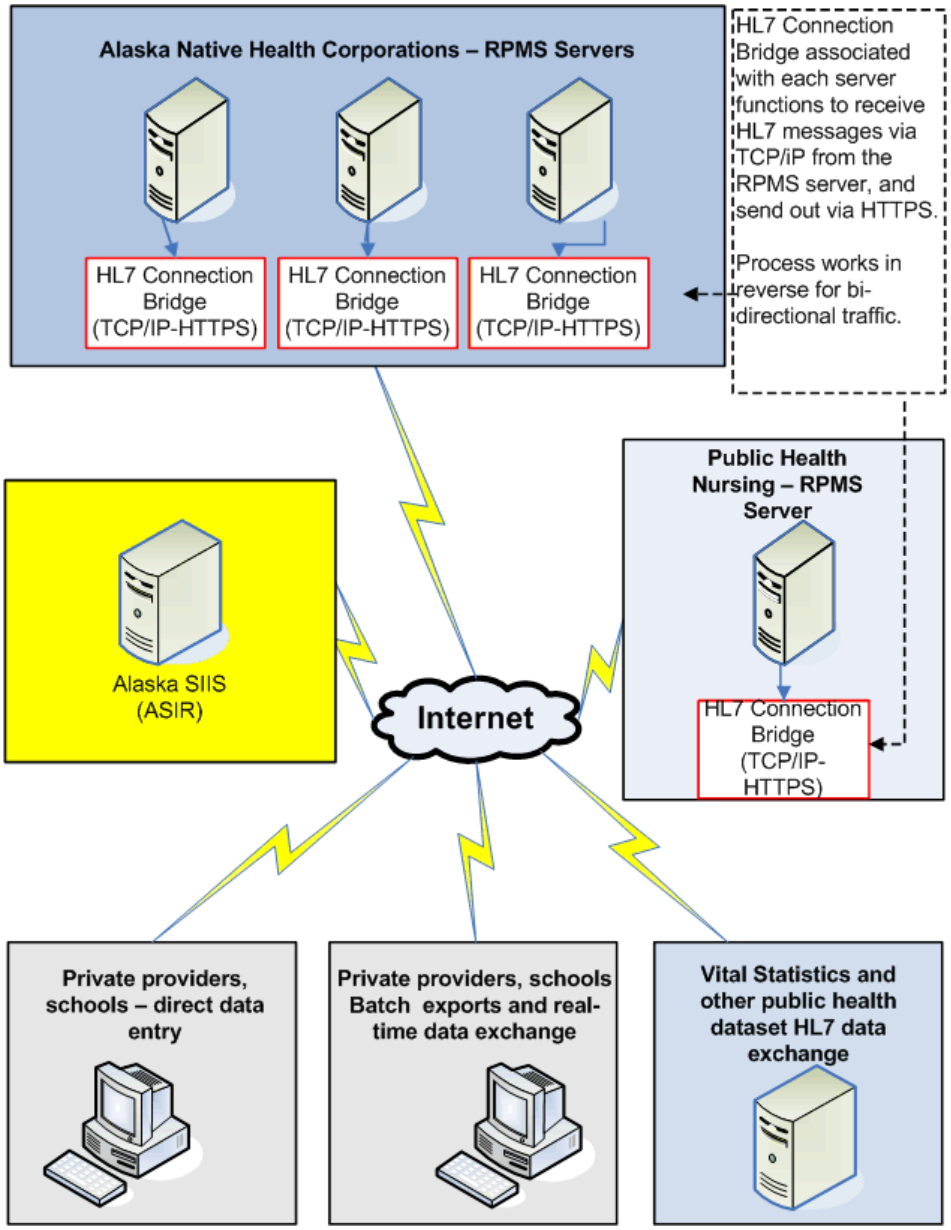
vaccinations entered to the child's vaccination record in RPMS are not transferred to the MFI. The capture of historical vaccinations is critical to the success of a statewide registry.

Because the MFI data elements won't meet patient record de-duplication standards for ASIR and because the MFI does not capture the historical vaccination records, at this point in time, the MFI is ruled out as a choice for data exchange with ASIR. In the absence of any modifications to the MFI, the proposed solution for the RPMS-ASIR integration is illustrated below:

RPMS-ASIR Proposed Solution

Figure 6-1: Proposed Data Flows Between the Alaska Native Health Corporations RPMS Servers and ASIR



This solution requires data exchanges between the ASIR and multiple RPMS servers (approximately 12 AK Native health corporations and 1 public health nursing server). The data exchange processes should be bidirectional, real-time exchanges to provide the greatest benefit

to the users. A change made to a patient record in the ASIR database should immediately update the RPMS databases that have the same patient record. Conversely, changes made to patient records in RPMS should immediately populate the ASIR database.

This multi-RPMS server communication scenario has the added advantage of simplifying compliance with data sharing decisions made by the individual Native health corporations. If a Health corporation elects to not share data with the registry, no data sharing functionality will be established with that particular RPMS server.

MFI-ASIR Proposed Solution

An optional solution may be possible however the implementation of this is dependent on modifications made to the MFI to include the capture of data element values that are not now populated, storage of historical vaccination records and the addition of HL7 data exchange functionality to the MFI. Also, buy-in by all the Native health corporations for sharing immunization related data with the registry will be critical.

The solution in the following illustration is characterized by the addition of the modified MFI and elimination of ASIR-RPMS server data exchanges. This solution does require significant MFI modifications but RPMS sites would continue to communicate with the respective RPMS servers as they do now. The MFI would exchange data with ASIR either via the Internet as illustrated in Figure 6.2 below, or via an Intranet across existing WAN's.

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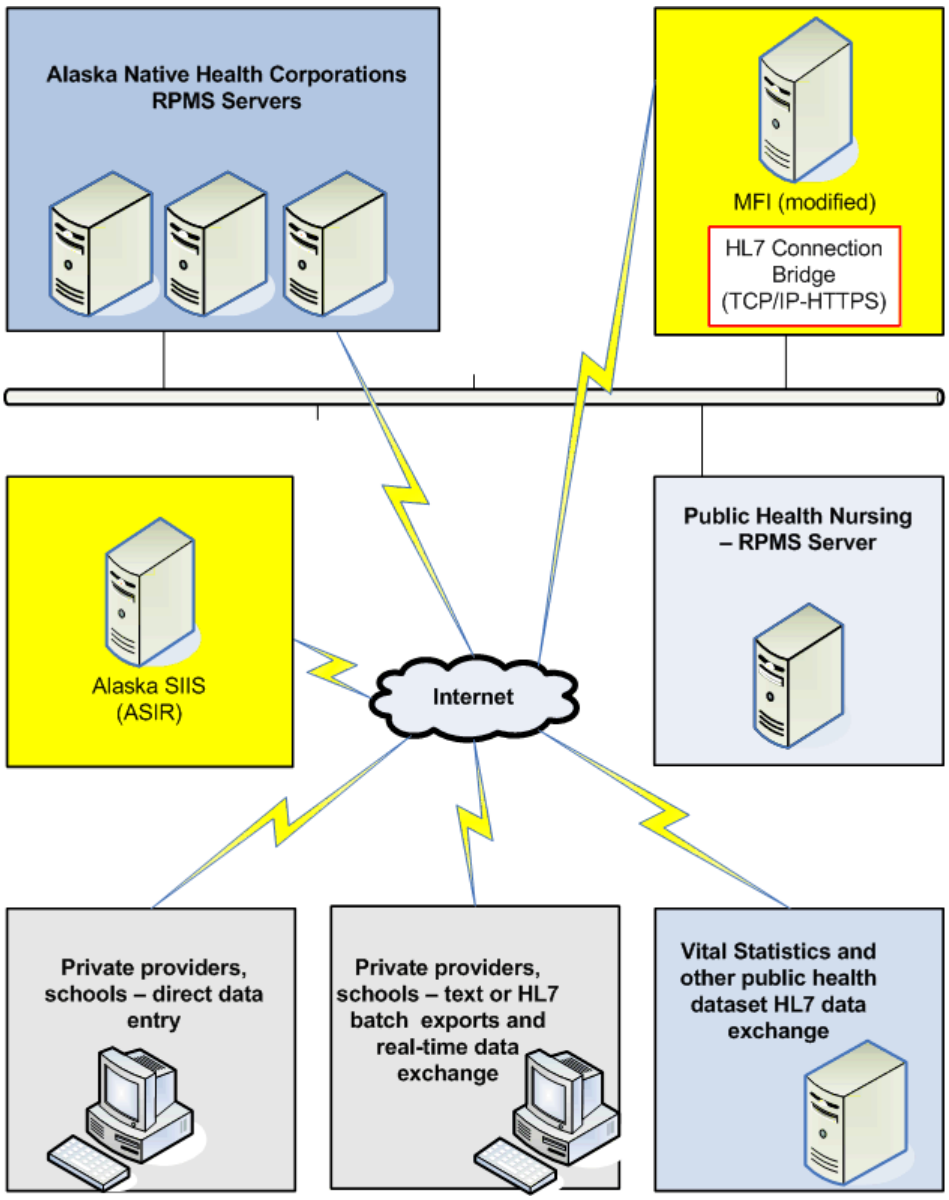
Figure 6-2: Proposed Data Flows Between the Modified MFI and the ASIR



Both of the solutions proposed focus on the problems unique to Alaska, that is, the integration of RPMS, the MFI and ASIR. In either case, private providers, schools, Vital Statistics and other key public health datasets are included in the illustrations. However, the dataflow processes for these organizations are well established in other states and don't present challenges unique to Alaska.

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Either solution will provide benefits to all providers throughout Alaska. The private providers and schools will have access to data coming from RPMS systems and the RPMS users will have immunization information submitted by the private providers. Also, RPMS users that do not have access to the child's record at the time of the encounter (first time visits to the RPMS clinics) will be able to view the most recent data the registry has and save these records to their system. Finally, with implementation of the MFI-ASIR solution, Internet connectivity challenges that some of the clinics now have become a much less significant issue.

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7.0 Appendices

The Appendices are separated into the following sections:

- Interview Participants
- Interview Tool
- Provider Questionnaire
- Interview Comments
- Vendor Software Applications in Use as Reported in Provider Survey
- Survey Responses
- References

7.1 Interview Participants

Table 7-1: Participants Interviewed for Alaska Feasibility and Needs Assessment (9/20/04 – 12/14/04)

ORGANIZATION/LOCATION	PERSON INTERVIEWED	TITLE
Alaska Department of Health and Social Services, Anchorage	Beth Funk, MD, MPH	Acting Chief, Epidemiology
	Toni Hackney	RPMS Coordinator
	Lauren Horn	Analyst/Programmer
Alaska Immunization Program, Anchorage	Laurel Wood, MPA	Immunization Program Manager
	Gerri Yett, RN, BSN	Deputy Immunization Program Manager
	Sherry Kew, RN	Nurse Consultant, Immunization Program
	Mike Pannone	Analyst Programmer, EPI Section
Fairbanks North Star Borough School District, Fairbanks	Denise Smart, BSN, DrPH	Nursing Services Coordinator
Fairbanks Public Health Nursing, Fairbanks	Sylvia Cowan	Clinic Manager
Chief Andrew Isaac Health Center, Fairbanks	Betty Pixley	Immunization Coordinator
	Shirley Collins	Immunization Nurse
Tanana Valley Clinic, Fairbanks	Marvin Bergeson, MD	Pediatrics
	Tom Creek	Information Systems Manager
Alaska Native Tribal Health Consortium, Anchorage	Ros Singleton, MD	Immunization Consultant Pediatrician
	Lindsey Caudle, RN, BSN	Immunization Nurse Consultant
	Irma DeSmet, RN	Immunization Nurse Consultant

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ORGANIZATION/LOCATION	PERSON INTERVIEWED	TITLE
Alaska Division of Public Health, Anchorage	Richard Mandsager, MD	Director
Alaska Native Tribal Health Consortium, Anchorage (follow-up telephone call)	Richard Hall	Director, Information Technology
Municipality of Anchorage (MOA) Department of Health and Human Services, Anchorage	Hisa Fallico, RN	Program Manager, Disease Prevention and Control
	Bruce Chandler, MD	MOA Medical Director and Pediatrician, Anchorage Neighborhood Health Center
Children's Clinic, Anchorage	Catherine Irwin, MD	Pediatrician
Mary Ann Jacob, MD Family Practice, Anchorage	Mary Ann Jacob, MD	Family Practitioner
Anchorage Pediatric Group, Anchorage	Dave Alexander, MD	Pediatrician
Bryant Family Practice at Providence, Anchorage	Beth Hill-Bryant	Pediatric NP
Alaska Center for Pediatrics, Anchorage	Thad Woodard, MD	Physician
Crooked Creek Clinic, YKHC	Kassi Keene, CHA	Certified Health Practitioner
Aniak Sub-Regional Clinic, YKHC	Jackie Wassilie, CHA	Certified Health Practitioner
Yukon Kuskokwim Health Corporation, Bethel	Deborah Burnard, RN	YKHC Immunization Coordinator
Bethel Public Health Center, Bethel	Jane Conard, BSN	Nurse Manager
Alaska Immunization Program, Vaccine Depot, Anchorage	Ken Browning	Manager
	Debbie Wiegele	Supply Technician
	Della Fisher	Administrative Clerk
Alaska Immunization Program, Anchorage	Doreen Strangel	Education and Training/Coalition Coordinator
MCH/Medicaid, Anchorage	Stephanie Birch	Maternal and Child Health (MCH) Director
	Gail Stolz	Birth Defects registry (BDR) Manager
Vital Statistics, Juneau	Phillip Mitchell	State Registrar
WIC, Juneau	Becky Carrillo	Assistant WIC Director
Public Health Nursing, Juneau	Rhonda Richtsmeier	Deputy Director
DHSS, Information Technology Services, Juneau	Ted Israelson	Data Processing Manager
	Dave Seng	Network Services Manager
	Rich Grayson	Application Services Manager
LaTouche Pediatrics, Anchorage	Jon Lyon, MD	Pediatrician
Family Practice, Wasilla Alaska Academy of Family Physicians	Barbara Doty, MD	Family Practitioner President AAFP

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7.2 Interview Tool

Figure 7-1: Interview Tool – Site Visit Questionnaire (Page 1 of 7)

Alaska Immunization Registry Needs Assessment and Feasibility Study
Site Visit Questionnaire

Interview Date_____

I. Contact Information

Name of Site or Organization Interviewed_____

A. Feasibility Study Interviewers (DHSS, STC)			
Name	Organization	Phone Number	E-mail

B. Site/Organization Information	
Address	
Phone Number	
Contact Person	
Organization Type (e.g., private practice, public health clinic, etc.)	
Service Area (cities/counties)	
Days/hours of operation	
Number of Nursing staff	
Number of Clerical staff	
Number of MD staff	
Information Technology staff	
Other staff (describe)	

C. Names/Contacts for Personnel Interviewed			
Name	Job Title or Role	E-mail Address	Phone Number

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Figure 7-2: Interview Tool – Site Visit Questionnaire (Page 2 of 7)

II. Current Methodologies – Maintenance of Immunization Records

D. Data Collection Methods

1. Immunization related information is collected and stored:

Electronic System _____ (Yes/No/Unknown)
Paper Only _____ (Yes/No/Unknown)
Both Electronic & Paper _____ (Yes/No/Unknown)

If paper only, please describe:

2. If an electronic system is used:

System Type
Billing System _____
Practice Management System _____
Electronic Medical Record _____
Unknown _____

System Name (e.g., RPMS, Medical Manager, MiSys, etc.)_____

From the following list, indicate data elements the system captures if known:

Date of birth	___	Mother's maiden name	___	Guardian Name	___
Telephone #	___	Address	___	Medicaid #	___
WIC ID	___	Race	___	Ethnicity	___
Vacc. date	___	Vaccine type	___	CPT Code	___
Vacc. Lot #	___	Vaccine expiration date	___	Vacc. Manufac.	___
VIS Vers./Date	___	Injection site/route	___		

Does the system provide:

Immunization forecasting _____(Yes/No/Unknown)
Immunization reminders _____(Yes/No/Unknown)
Invalid dose warnings _____(Yes/No/Unknown)
Inventory management _____(Yes/No/Unknown)

What types of immunization related reports are created and who are the recipients? Please provide examples such as vaccine accountability reports, school shot records, etc:

Does the system interface with other systems or produce data exports for other systems _____(Yes/No/Unknown)

Please describe interfaces or export capabilities:

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Figure 7-3: Interview Tool – Site Visit Questionnaire (Page 3 of 7)

D. Data Collection Methods, cont.
3. Estimated number of children < 18 years, immunized per month: _____
4. Estimated percentages of children immunized by the local health department compared to the percent immunized by the private provider or Alaska Native Health Corporation Clinics in your area: Public Health clinics _____ Alaska Native Health Corporation Clinics _____ Private Practices _____ Not able to determine _____
5. Estimated percentage of time that parents hand carry the child's shot record to the clinic when the child needs to be immunized: _____
6. Estimated percentage of time the child's hand carried shot record is utilized to update or complete historical information in the office record. _____
7. Are you aware of any reasons that the volume of immunizations may increase or decrease in your area? If so, please explain:
8. Does your clinic administer immunizations outside of your facility? If so please describe (e.g., schools, events or other remote clinics): If so, then how do you transpose the information to your clinic records?
9. Describe your immunization program: clinic hours, activities, coalitions, outreach, etc:
10.Do you utilize the CDC WinCASA program to determine coverage levels? _____(Yes/No/Unknown) Have you had an immunization audit by the state program in the last five years and if so how many?

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Figure 7-4: Interview Tool – Site Visit Questionnaire (Page 4 of 7)

11. Describe the process for patient recall in the event of a manufacturer vaccine recall or in a case of compromised vaccine due to out-of-range storage temperatures:

D. Data Collection Methods, cont.

12. Describe how you determine who is due for shots, remind and schedule patients to come in:

13. Describe your interaction with schools and daycares:

14. Describe the types and volume of calls you receive regarding immunizations:

III. Capacity to Participate in an Electronic Reporting System

E. Computing Resources

15. Does your office maintain one or more PC's?

_____(Yes/No/Unknown)

If yes, how many computers are in available for patient care_____

16. Are the computers in your organization part of a local or wide area network?

_____(Yes/No/Unknown)

17. Does your office have access to the Internet?

_____(Yes/No/Unknown)

If yes, please describe the connection type:

_____Modem dial-up
_____Cable
_____DSL
_____Satellite

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Figure 7-5: Interview Tool – Site Visit Questionnaire (Page 5 of 7)

_____Not sure, provided by our network
_____Unknown

In your opinion is the connect speed: _____Very good Good_____
Poor_____

E. Computing Resources, cont.

18. If your office has access to the Internet, what Internet browser do you most often use:

_____Microsoft Internet Explorer
_____Netscape
_____Mozilla
_____Other, specify_____
_____Unknown

19. List the operating systems in use for the computers in your office. Examples include: DOS, Windows NT 4.0, Windows 95, Windows XP, Macintosh, Linux, etc.

20. Please rate the level of computing skills by staff category using a scale of 1 to 5. (1 = No computing skills, 5 = High computing skills)

Nursing staff _____
Clerical staff _____
Management staff _____
Medical staff _____
Information technology staff _____
Other staff _____

21. Do you feel that there are sufficient computers in the organization to allow access by all staff who need computer access for patient care?

_____(Yes/No/Unknown)

22. Do you feel the computing resources would be adequate for access to a Web-base immunization registry system if it existed?

_____(Yes/No/Unknown)

23. Describe plans (if any) to upgrade the organization's computing resources, including Internet access:

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Figure 7-6: Interview Tool – Site Visit Questionnaire (Page 6 of 7)

F. Interest for Participation in an Electronic Reporting System

A primary objective of an immunization registry is to provide a consolidated patient shot record to all immunization providers statewide. With a well populated registry and wide use by the majority of private, public and other providers within the state, the registry can provide the tools necessary to monitor immunization coverage levels, automate reporting, automate reminder/recall, and target the "pockets of need". An immunization registry is thus one tool providers and the DHSS can use to achieve the health goals of clinics and the state.

24. Rate the importance of the following registry characteristics as they apply (or could apply) in your clinic (5 = Very important; 1 = Not important):

Immediate access to complete, current immunization information on all patients _____

Reminder/recall functions _____

Immunization forecasting and past due notification _____

Assessing clinic immunization coverage levels _____

Assistance with vaccine inventory and accountability _____

Automatic production of personal, school and child care immunization records _____

25. Rate the following concerns you have/may have with participating in an immunization registry (5 = Very concerned; 1 = Not concerned):

Cost _____

Lack of computer equipment and or software _____

Data entry workload _____

Duplicate data entry _____

Patient confidentiality _____

Accuracy and reliability of data _____

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Figure 7-7: Interview Tool – Site Visit Questionnaire (Page 7 of 7)

System availability
at all times _____

On-site technical support _____

Staff turnover and training _____

F. Interest for Participation in an Electronic Reporting System, cont.

26. The level of effort required by providers to participate in an immunization registry varies depending on factors such as the volume of vaccinations given and integration between the clinic billing or practice management system and the registry.

Indicate the willingness of your organization to conduct tasks such as searching/updating patient records and entering new patient records:

The clinic is willing to perform these tasks and can devote ____ hours per month to the data entry requirements

The clinic is not willing to enter new patients or update patient immunization information – we already enter this information in our billing or practice management system____ (check)

The clinic would benefit from access to the registry if the transfer of patient records along with immunization information from the clinic system to the registry was automated____ (check)

Comments:

27. Indicate your level of agreement that participation in a statewide immunization registry can be beneficial to you as a provider or immunization program manager:

Strongly agree___ Moderately agree___ Do not agree___

Comments:

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7.3 Provider Questionnaire

Figure 7-8: Provider Questionnaire (Page 1 of 5)

Alaska Immunization Registry Needs Assessment and Feasibility Study Questionnaire

Date Completed_____

Contact Information

A. Site/Organization Information	
Name of person completing survey	
Name of clinic or organization	
Address	
Phone Number	
Other contact Person	
Organization type (e.g., private practice, public health clinic, etc.)	

I. Current Methodologies – Maintenance of Immunization Records

B. Data Collection Methods

1. **Do you use an electronic system to capture patient demographic and vaccination information___(Yes/No)**

   If yes, please provide the following information:

   System Type — Billing System _____
   Practice Management System _____
   Electronic Medical Record _____
   Unknown _____

   System Name (e.g., RPMS, Medical Manager, MiSys, etc.) _____

2. **Estimated number of children < 18 years, immunized per month:** _____

3. **When a child comes to your clinic, how often do you have access to the child's complete vaccination history?**

   Estimate Percent of time_____%

4. **How much time would you estimate is spent each week by your clinic to create immunization records for parents, schools, day cares, etc?**

   Hours per week_____

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Figure 7-9: Provider Questionnaire (Page 2 of 5)

5. How do you remind and schedule patients to come in for immunizations:

6. Describe the process you would use for patient recall in the event of a manufacturer vaccine recall or in a case of compromised vaccine due to out-of-range storage temperatures:

II. Capacity to Participate in an Electronic Reporting System

E. Computing Resources

7. Does your office maintain one or more PC's?

_____(Yes/No/Unknown)

If yes, how many computers are available for patient care_____

8. Does your office have access to the Internet?

_____(Yes/No/Unknown)

If yes, please describe the connection type:

_____Modem dial-up
_____Cable
_____DSL
_____Satellite
_____Other
_____Unknown

In your opinion is the connect speed: _____Very good Good_____
Poor_____

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Figure 7-10: Provider Questionnaire (Page 3 of 5)

9. Do you feel that there are sufficient computers in your facility to allow access by all staff who need computer access for patient care?

_____(Yes/No/Unknown)

III. Interest to Participate in an Electronic Reporting System

F. Interest for Participation in an Electronic Reporting System

A primary objective of an immunization registry is to provide a consolidated patient immunization record to all immunization providers statewide. With a well populated registry and wide use by private and public within the state, the registry can provide the tools necessary to monitor immunization coverage levels, automate reporting, and facilitate reminder/recall.

10. Using a scale of 1 to 5, rate the importance of the following registry characteristics as they apply (or could apply) in your clinic (1 = Not important; 5 = Very important):

Immediate access to complete, current immunization information on all patients _____

Reminder/recall functions _____

Immunization forecasting _____

Past due notification _____

Assessing clinic immunization coverage levels _____

Automated vaccine inventory and accountability _____

Automatic production of personal, school and child care immunization records _____

Other benefit (specify) _____

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Figure 7-11: Provider Questionnaire (Page 4 of 5)

11. Using a scale of 1 to 5, rate the following concerns you have/may have with participating in an immunization registry (1 = Not concerned ; 5 = Very concerned):

Lack of computer equipment and or software _____

Data entry workload _____

Duplicate data entry (same information multiple systems and/or paper) _____

Patient confidentiality _____

Accuracy and reliability of data _____

System reliability (minimal downtime) _____

Registry technical support _____

Staff turnover and training _____

Other concern (specify) _____

12. The level of effort required by providers to participate in an immunization registry varies depending on factors such as the volume of vaccinations given and integration between the clinic billing or practice management system and the registry.

Indicate the willingness of your organization to conduct tasks such as searching/updating patient records and entering new patient records:

The clinic is willing to perform these tasks and can devote ____ hours per week to the data entry requirements

We already enter this information in our billing or practice management system____ (check)

The clinic would benefit if the transfer of information from the clinic system to the registry was automated ____ (check)

Comments:

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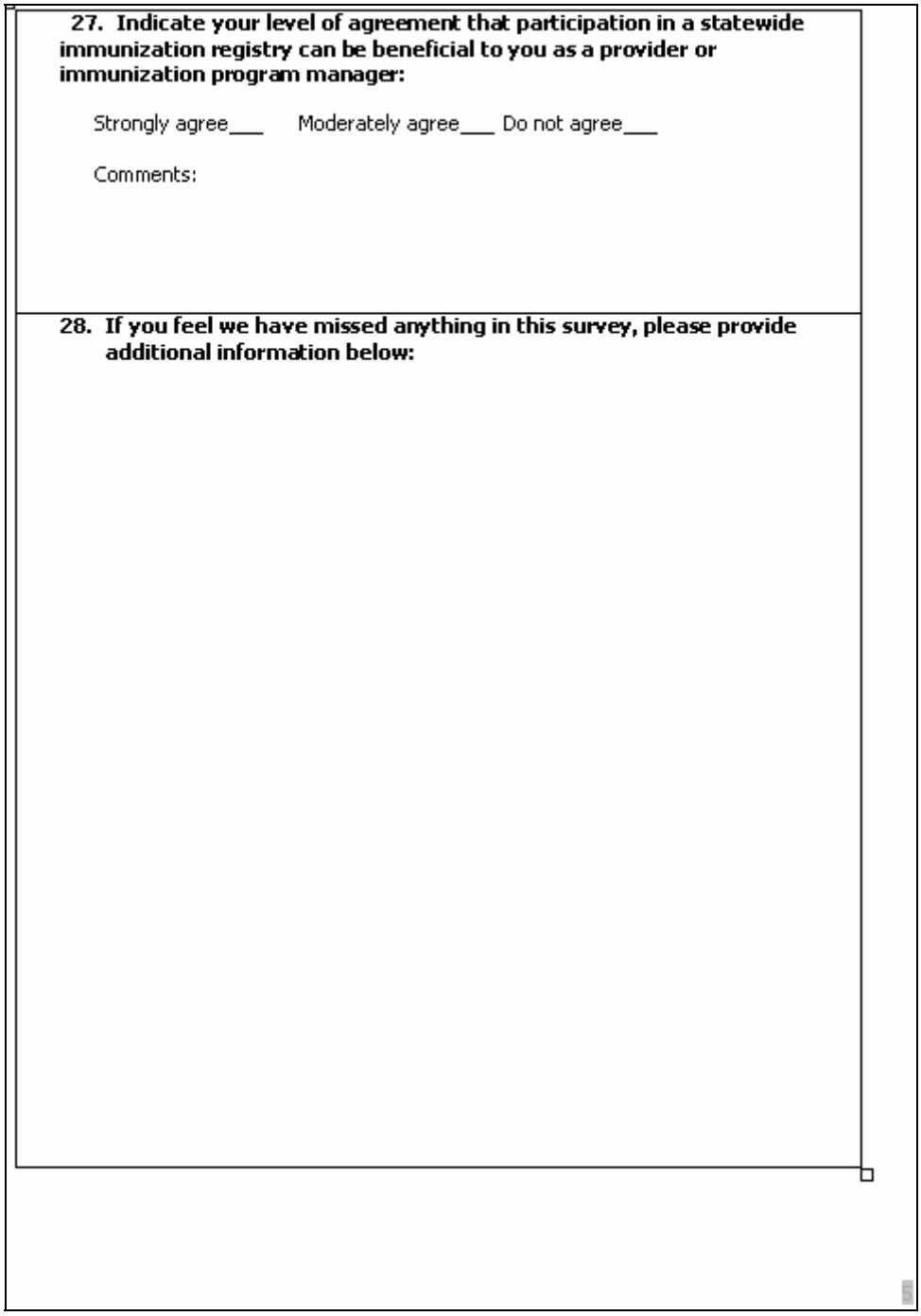
Figure 7-12: Provider Questionnaire (Page 5 of 5)



27. **Indicate your level of agreement that participation in a statewide immunization registry can be beneficial to you as a provider or immunization program manager:**

Strongly agree___ Moderately agree___ Do not agree___

Comments:

28. **If you feel we have missed anything in this survey, please provide additional information below:**

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7.4 Interview Comments

Table 7-2: General comments regarding implementation of a registry received during interview phase

RATING	DESCRIPTION
Positive	• General benefits: access to complete/accurate immunization information on all patients, reminder/recall functions and automatic production of immunization records • Beneficial for providers to submit doses administered reports online • State registry would reduce call volume during start of school • Use of reminder/recall features and generation of letters/labels • Larger private clinics would benefit from access to a registry • Could help avoid over-immunization • Could also track adult shots • No foreseeable barriers with sharing Vital Stats data with an immunization registry • No foreseeable barriers for the schools to participate in the registry • Movement toward national registry would be good • Willing to do whatever it takes to participate • Would be great, if utilized • A comprehensive, accurate statewide registry is needed
Negative	• General concerns: cost of the registry, available technical support, accuracy of data in the registry, data entry workload and possible duplicate data entry • Concerns over cost and cost versus value • Concerns about higher overhead and lower clinic profit margins, reimbursement rates are already too low • Concerns about ease of use and obtaining widespread support from providers • Concerns about registry funding, IT support issues and confidentiality issues • Skeptical – needs to see the value of a statewide registry • Lots of resistance to change among providers • Staff shortages for performing data entry • Providers not willing to increase data entry workload beyond current resources • Some areas with limited internet connectivity • Tactical issues with conducting training especially in remote areas and addressing staff turnover • Limited benefit of integrating a registry with the communicable disease reporting (CDR) application • Would not be a benefit for determining pockets of need

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RATING	DESCRIPTION
Suggestions/Considerations	**Confidentiality/Data Sharing:** • Pass legislation to allow better record sharing between schools, providers, etc. • Pass legislation to provide liability relief to providers • Work with Tribal Corporations to improve data sharing • Consent should not be required • HIPAA compliance and registry security are issues
	Public – Private Provider Relations: • Providers must participate/must have buy-in • Will need buy-in from all of the Native Health Corporations • Providers should be participating in an immunization registry, especially since vaccine is provided free of charge • Registry must be free of barriers • Registry efforts will have to be sensitive to maintaining good public private relationships
	Integration: • Registry should integrate with VACMAN • Integration with WIC application would be very beneficial to make program more efficient and reduce staff workload • Integration with hearing screening data might be of value • Integration with existing applications (electronic medical records, patient management and billing systems, etc.) is critical, especially among private providers • Military records should be shared with the registry • Registry should also populate RPMS • RPMS users should only have to work with one application/interface

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RATING	DESCRIPTION
	Registry Features: • Application must be user friendly • Forecasting on accelerated schedule needed • Needs to collect adverse reactions, contraindications and inventory information, wasted/spoiled vaccine • Registry should include an ordering module • Would have to take AK school/child care requirements into account • Auto-dialer capabilities would be beneficial • GIS features would be beneficial • Should capture visit type, visit ID and active status • Ideal if a central registry could capture the initial hep B shot • Needs ability to provide vaccine volume and cost information to providers for education during AFIX/VFC visits • Registry should include children, adolescents, adults and seniors • Parent refusal of vaccinations should be confidential
	General Comments: • Registry should save time versus increase burden with additional data entry • Data must be entered promptly • Parent/general population education will be critical • Connectivity issues in villages must be resolved if a web based application is considered • Must be an all or nothing initiative • Must have formal help desk support structure for users • Still need to accommodate paper processes • RPMS is not the answer • Insurance companies should assist with cost of the registry • Additional hardware and staff training is needed

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7.5 Vendor Software Applications in Use as Reported in Provider Survey

Table 7-3: Vendor Software Applications in Use

VENDOR	FREQUENCY REPORTED
RPMS	12
Soapware, Lytec	4
E Clinical Works	2
Medical Manager	2
Medisoft	2
Practice Partner	2
AMI	1
HealthPro	1
MD Server	1
MegaWest	1
Misys, Amicore/Pencinart	1
npais	1
Softrix	1
Total	**31**

7.6 Survey Responses

Open Ended Comments from Provider Survey Responses.

Table 7-4: Survey Responses

QUESTION	OPEN ENDED COMMENTS
How do you remind and schedule patients to come in for immunizations?	• Send reminder postcards Schedule when they call or come in • RPMS form letters, use phone calls for overdue clients • Postcard is completed when child is immunized and mailed when next visit is due • Children: done concurrently with well-child visit, and reviewed at every office visit adults: reviewed at yearly

QUESTION	OPEN ENDED COMMENTS
	physicals and new patient evaluations. • At annual and regular appointments patients are reminded of immunizations needed at particular times in life -- unless an order is written for a specific immunization, the patient is not reminded of the need. Schools will not allow kids in class without up to date shots. • Public health nurse (now retired) and memory • Dr's advise parents when they should return. • We place postcard in tickler file for reminders and we also have an individual who makes up postcards to outreach clients who are due • We are an ob/gyn practice. The only pts with set schedules for vaccinations are our maternity pts. We also update pneumovax for eligible pts (and tetanus per pt request). • We schedule PPDs in September, flu vaccine in October, pneumovax individually determined. • Due lists to village clinics monthly, due letters to parents every other month. • At time of exam and reminder cards. • Indication on the vaccine record when the next shot is due. • RPMS • QCP system, computer keeps records if it is entered by provider. This only for our established patients. We see non-established children for immunizations. • Tickler card system • We don't at this time • Tickler file box with reminders filed under month and day • Post cards, phone calls • Patients come in on an as needed basis • Chart review phone • N/A - adult clinic • When they come in for visits • Tracking system - cards sent out. This depends on several people getting the info to the person who keeps this record • 1) phone calls 2) reminder cards 3) upon completion of visit - told when next shots/immunizations due • Send out tickler cards provided by AK immunization program • Pt. responsibility • We remind all well child checks to bring shot records to appt. • Patients take responsibility for remembering and scheduling their own immunizations • Appt. cards - patient responsibility

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	• At well infant and child exams, immunization history is reviewed and recommendations made - most shots given by PHN • Postcards and 'due' letters • In person • Send vaccination cards out • Telephone calls, post cards, letters • Tell them at time of injection when next one is, also write date on record • Verbally during vaccination, tell them when next is due • Well child checks • Phone calls, post cards • We administer the flu vaccine for free to our clients and employees and we post signs throughout our facility to notify clients. • At time of appt. - parent is reminded of time for next shot • Reminder cards • Remind at each well visit • Sending a reminder card • Nurses track primary patient needs • Next appt, verbal @ appt. time • Pt. management system (electronic) • Monthly letters 0-24 or 0-36 months, special kindergarten letters 4 years, no adult letters, special follow up letters in fall, phone calls 5x's per year when time allows • Phone call • 1) at last visit include reminder, next visit immunizations are given 2) we send reminders to high risk patients for influenza • On appointment ledger and during school physicals • Recall system • We use the reminder cards from the state. Immunizations are usually scheduled with a well check unless they are catching up or completing a schedule. • By putting the return time on the immunization record
Describe the process you would use for patient recall in the event of a manufacturer vaccine recall or in the case of compromised vaccine due to out-of-range storage temperatures:	• Run list in RPMS or pull records and group encounters of those seen in time frame. Call patients and/or send letters. • Phone contact if few - letter if many • We could run reports to screen some of our population. Some work would probably need to be actually looking at immunization cards and sending out notices. • Would love to ask billing service to provide us with a list of patients billed for what vaccine codes, and pull each chart for review • Compromised vaccines or out of range temps are returned with explanation to Anchorage -- we are in process of

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	planning a patient recall in event of a manufacturer vaccine recall - plan not complete • Search charts • We keep a detailed record of every vaccine given: by vaccine, lot #, exp date, nurse who gave it, pt who received it, and date of birth in a book separate from the patient's chart. We would look up the specific vaccine recalled and call the parent whose child had received that vaccine. • All immunizations are input into RPMS with their lot numbers. We would then print out a list of those who received that lot number and call each individual. • Print out list of pts who received vaccine, verify they received affected vaccine, and call pt. • Our patients are monitored daily and in house. • Pull up lists from RPMS in a variety of ways depending on situation - 1) by lot number, 2) by iv given, followed up with electronic chart review. • Look at each chart that had an immunization given at that time and had a matching lot number - call parents. • 1)Check vaccine log for lot # 2)pull any charts of pts that received that lot 3)call and/or mail info to pt. • RPMS and chart review and schedule review! Contact pts by phone and letter. Repeat immunizations as indicated. • All records pulled and reviewed. Extra time, extra staff, documentation • Look on computer to see who had the shot during time period, pull each chart to see if it was in the lot # recalled • Nursing staff would make calls • Pull charts, view vaccine info, contact those affected • Mail, phone • Check our patient log and call patients for appropriate follow up • a)Patient log scan, telephone contact b)phone, Dept. Epi, report, spoiled vaccine returned • Run Lytec database to check list of patients given vaccine (and/or check manual record) 2) contact Anchorage Health Dept/State Health • Review logs, identify lot and batch, call pts. • The receptionists keep a list of all pts who have received vaccines - we use this to ID who needs to be notified • Review of lot# by RPMS - and call each client to return to clinic • Take the lot # of the compromised vaccine and compare it to the administration log to find the name of the patient and have that patient return to discuss witha physician what should be done

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	• Database search and phone identification • We would pull all vaccines and return them. we would contact all patients that have received these vaccines. • Print vaccine reports - we have adults only • Using our medisoft system, I would create a list of patients who had received these vaccines and call them. • All lot #'s are recorded on consents - would have to pull all consents, see who it applies to and notify by telephone or mail... • Review list of immunizations that were provided at this office (by mfg and lot #) and call patients back in. this list was originally compiled to provide their information to the local PHN office in Homer, I understand that this form of registry is to be discontinued by the local office - too bad! • Option 1: if RPMS data is up to date, survey by iz and lot #, print out clients and phone option 2: if RPMS data is not up to date, manually go back through group service forms, charts and then call • Pull chart and use contact information to locate client • We keep track of who we immunized so if there was a recall then we would call them and let them know, so is we need to bring them in we can. • We would call the family and send a letter if needed • Look at the individual count cards we use to keep track of vaccines given • Go through appt. books and charts • Phone calls, post cards • They each fill out a consent form and we keep client phone/address on file • Enter dates into computer of immunizations given during certain time period, run report and start calling pts. • Retrieve patient names from billing system, confirm with charts, contact families • Chart review and call to pt. if affected • Have log to enter date of vaccine received date with lot # included • Maintain manual systems - general memo notification in the facility • Billing dept. would contact amicore and report would be run depending on lot or name • We keep a manual list of immunizations given, date, lot # and names. We could go back in chart and contact pt. • Check lot #'s 2) check computer for who received the vaccine in the stated time frame 3) check those charts for vaccine lot number, call those who received to inform of needed follow up • Don't have a clue

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	• Phone call • We could search data for appropriate pts., call or write • Maintain log of lot numbers and extract immunization data from medical database and notify affected patients • Phone and letter • Currently this would have to be done manually. We are in process of moving to EMR.
Additional benefits of registry implementation:	• Less duplication for some children and easier to find gaps for other children • In case of vaccine recall, having a list of patients given a particular vaccine would help immensely and save time/ensure accuracy and completeness • Accessibility by patients who need records for college application or travel • Reduction of inappropriate iv given or missed opportunities • Other health maintenance objectives could be programmed • Eliminate public health calling to request us to use MFI
Additional concerns regarding registry implementation:	• Any additional man hours spent on immunization programs • Duplication, lack of time, this not directly impacting the daily care of our residents • Do not think we will have 100% cooperation - especially with larger private facilities. • Completeness • Base of software use • Data input accuracy at state level
Comments regarding additional efforts to enter data into a registry:	• Our data entry system is great! I would hate to see the data have to be entered twice. • We insist by policy that children coming for immunizations have their documentation brought in a couple days prior to immunization and dr's appt. The nurse reviews this info, checks for accuracy, and sets up those vaccines in a 'pack' with the patient's name/proposed immunization date in a bag, puts in fridge with other stored vaccines, the VIS are put in the patients chart at that time. When the patient arrives this serves as a double check system as the dr reviews the records also. Should the patient cancel or go elsewhere the vaccines are returned to general group of vaccines. We communicate routinely with the public health nurse and have a productive relationship sharing vaccine information, new product information, etc. • Our clerical staff are really good at making sure historical records and current records are input. • We do not enter pt. information in a data base (other than billing info.). We have minimal staffing and only 2

QUESTION	OPEN ENDED COMMENTS
	computers. Vaccine records are kept in our logs and the pts file. • It would take time, but I see very important benefit to this. • Due to our limited computers in office and the relatively low number of immunizations given at our facility, participation would be minimal • Excellent idea if privacy and security are good • Can't answer these questions. need to discuss with business office manager and medical records director. • I totally agree and need to have data available from central location for entire state • We would be entering the information twice, once in our EMR and again in the registry
Additional general comments:	• State system should be compatible with nationwide EMR system standards (under development) • Any ideas for inputting data from regional youth facility (detention facility for kids) we service in a manner that won't compromise HIPAA? Perhaps a code system or call in our 'satellite service'. we have contract with that facility for screening and healthcare. What do other folks do in similar circumstances? • Strongly disagree that a registry is needed! The parents need to be responsible to keep or retrieve their child's immunization records. We enforce this in our clinic very strongly and only have problems with a couple parents at most. It would appear that this looks to be an 'easier' more accurate way to track immunizations, however we already spend several hours filling out 1) patient charts, 2) vaccine stock, 3) vaccine administered, 4) returned vaccine forms, 5) changing discs in thermometers, 6) monitoring temps twice daily, 7) compiling all this at the end of every month and faxing to state. In a private clinic, we see a wide variety of patients not just children for immunizations or infants for hearing tests, and while both of these are wonderful programs and I'm thankful the state provides the vaccine and equipment for these two programs, it is beginning to get a little much in addition to running our clinic. No, please refrain from adding any more. Also, parents need to take responsibility, let's not take that away from them! • Who would be responsible for recall when a client is seen by both the health depart and private provider? Is the recall system going to be central or are providers till going to be doing the outreaching? If individual providers are outreaching, is there going to be a way through the registry that a reminder was sent? • In Bethel, computers are adequate. Insufficient resources in village settings - inadequate connection speed.

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	• This would be very beneficial and health care providers and to schools. The only, or one if the problem is that small clinics like ours do not have the budget to make it work. • We don't see children. • I want to be sure that the data entry into RPMS that we are now doing, will automatically flow into the state registry • Pneumonia shots - patients never read the dates and often get from various providers. • The software is critical to your success. Send out Beta Test versions for people like me who are using total EMR so we can see if it really works efficiently and is user friendly. Critical is the ability to drag and drop data and text blocks into soapware patient notes and other EMR systems. If it adds too much work load, I won't use it! • Homer Medical Clinic does not immunize under 18 y.o., so a lot of this survey does not apply at this time. But HMC has been using electronic charts for 4 years and we would be very interested in having access to childhood immunizations. Public health does birth to 18, but HMC sees these patients for wellness and sick visits. • Due to the fact that information available on the Internet is not strictly confidential, patients should be able to choose whether they wish to participate in this registry or not. If some patients choose not to participate, this would partially defeat the purpose of having an immunization registry. • We do not treat people under the age of 18 • Beneficial to patients and for PHS statistical concerns. Again: our local PHN office has informed us they will no longer be doing data entry for immunizations done in private offices. Someone needs to do this. • The registry benefit also involves keeping inventory information up to date, daily, which is also a huge issue with mass vaccine efforts such as the reallocation of vaccine to other health centers and private providers. • We serve homeless teenagers who never have their immunization records. This type of system would be extremely helpful. • We are a subspecialty office. Our main vaccinations are the influenza vaccine. We do see pts. in the office and during h&p the physician inquires about immunization status. The patients are often unsure. with a statewide registry, we would be able to check on status and perhaps catch some of the children falling through the cracks. It would not be large #'s, but every little bit helps. Number of vaccinations significantly higher during flu vaccine

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	season - virtually 100% of our patients are high risk. We request vaccine records on all new pts. As a specialist most of our pts. get routine vaccinations with primary care providers. • We currently do not have a children's population, we're adults only • It would help the pt's parents stay more accurate for the injections. It would be nice to have records available from other clinics. • We are very interested in this program. Please count us in!

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